ENGINEERING NEWS-RECORD

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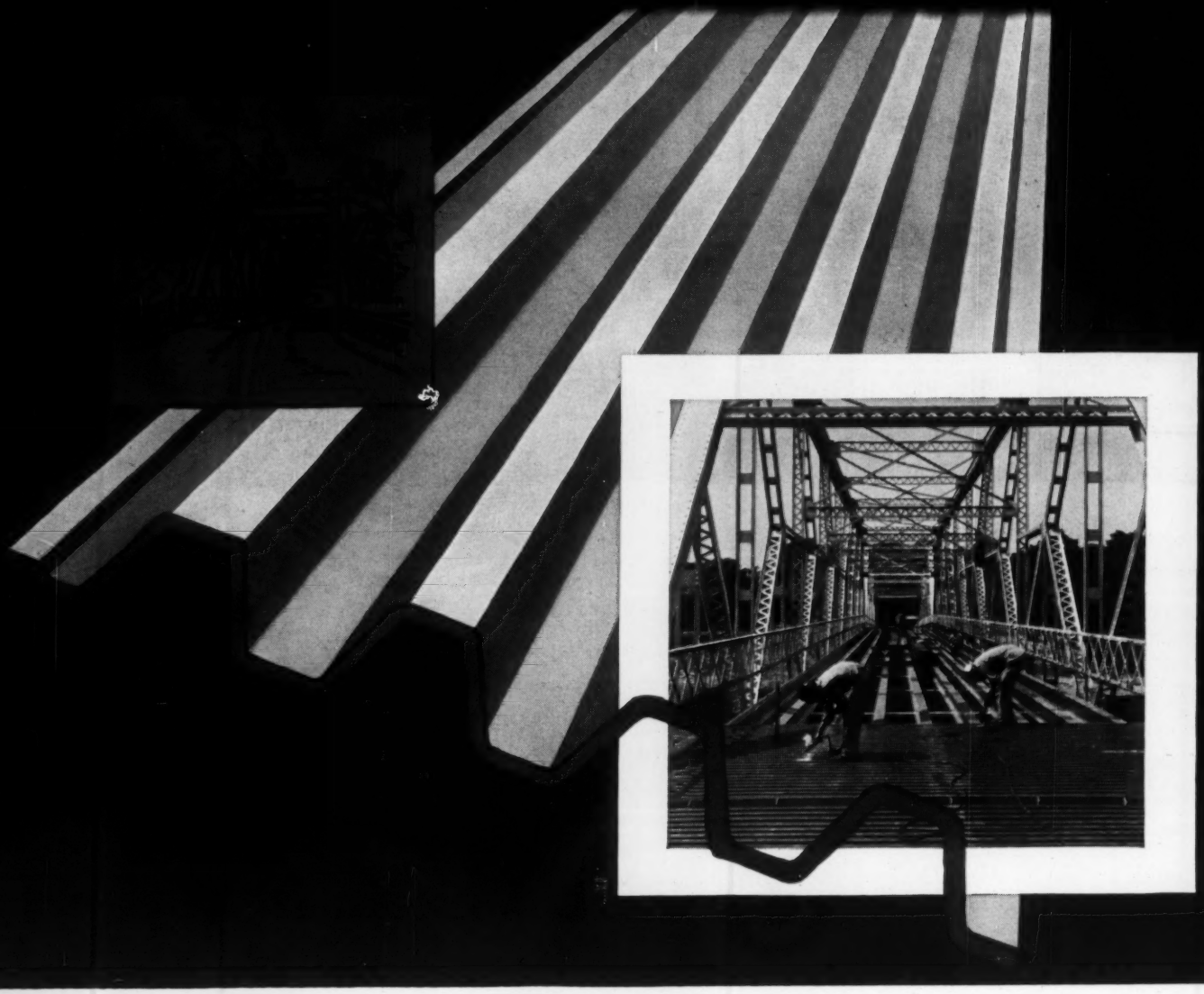


Bridges got the silent treatment

You can't always tell the age of a bridge by the number of rattles. The clang and clatter of worn-out flooring made many bridges sound old before their time. Floor replacement was often expensive and short-lived.

Then Armco Engineers decided to give bridges the silent treatment. They developed Armco Corrugated Metal Bridge Plank. It was strong, light in weight, easy to install and low in cost. This planking could be welded to steel stringers or bolted to wooden ones. The entire structure was stiffened. An asphaltic concrete traffic surface completed the job.

Thus traffic was assured a safe, smooth crossing, free of noisy clatter. Maintenance was reduced to no more than normal road surface upkeep.

Providing better products to meet specific needs has been standard practice at Armco for more than 40 years. A few examples are FLEX-BEAM Guardrail, Pipe-Arch, ASBESTOS-BONDED Pipe and MULTI-PLATE Bridges. Today you can bring your drainage and construction problems to Armco with full assurance you will receive all the benefits of long experience, extensive research facilities and a real interest in helping you solve these problems.

Armco has a complete range of engineered products and convenient, authoritative data to help you. If your problem is difficult or unusual, why not talk it over with us.

ARMCO

ARMCO DRAINAGE & METAL PRODUCTS, INC.

SUBSIDIARY OF ARMCO STEEL CORPORATION • MIDDLETOWN, OHIO

"Production often exceeds 32 bucket loads an hour" with the P&H Model 105 TC

Here's another example of the earning power of the P&H Model 105 TC: *Concrete handling* — cited by P. A. Thrall & Sons, general contractors of Aurora, Ill. Production on various jobs ranges from 26 to over 32 loads per hour. They say, "The limiting factor is the trucks bringing in the ready-mix."

As a trench hoe, this same machine recently dug 420 feet of 30" trench 4 feet deep in less than 5½ hours. About maintenance: "Instead of constantly paying out money for repairs, we have spent less than $100 in the first year for parts on the whole P&H unit."*

The Model 105 TC has a 10-ton lifting capacity. It's fully convertible, of course. Get complete details from your P&H dealer.

*User's statements are taken from a certified Gould Report. Copy will be sent upon request. Write for Gould Report No. 5503. Or ask your P&H dealer.

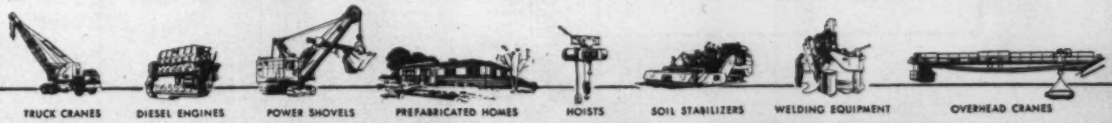
P&H POWER CRANE & SHOVEL DIVISION

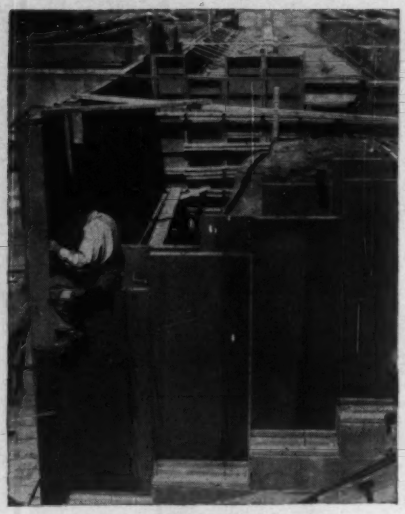
HARNISCHFEGER CORPORATION • Milwaukee 46, Wisconsin

SEE YOUR DEALER

"Your P&H Dealer has the experience, the organization and the facilities to serve you reliably in every way. He's ready to deliver the kind of on-the-ground service that keeps your jobs moving on schedule. Your P&H Dealer is tops in the business. Get to know him."

The P&H Line





Symons Forms for Stepped Footings

The construction of stepped footings, ordinarily an expensive method of forming, was handled at no extra expense, on the administration building at the Sandia (N.M.) Air Force Base, by the use of Symons Forms.

Symons Forms are adaptable to commercial, industrial, institutional and public works construction jobs. Symons Service covers the details of a forming job from start to finish. Our engineering staff has had experience with all types of forming and will make many valuable suggestions. Our salesmen are trained to give excellent advice on form erection, pouring and stripping methods. Form layouts and job cost sheets are provided upon request without charge or obligation. This service enables the contractor to get a clear picture of his job, its cost, bill of materials and labor saving methods.

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Robert F. Boger

Publisher

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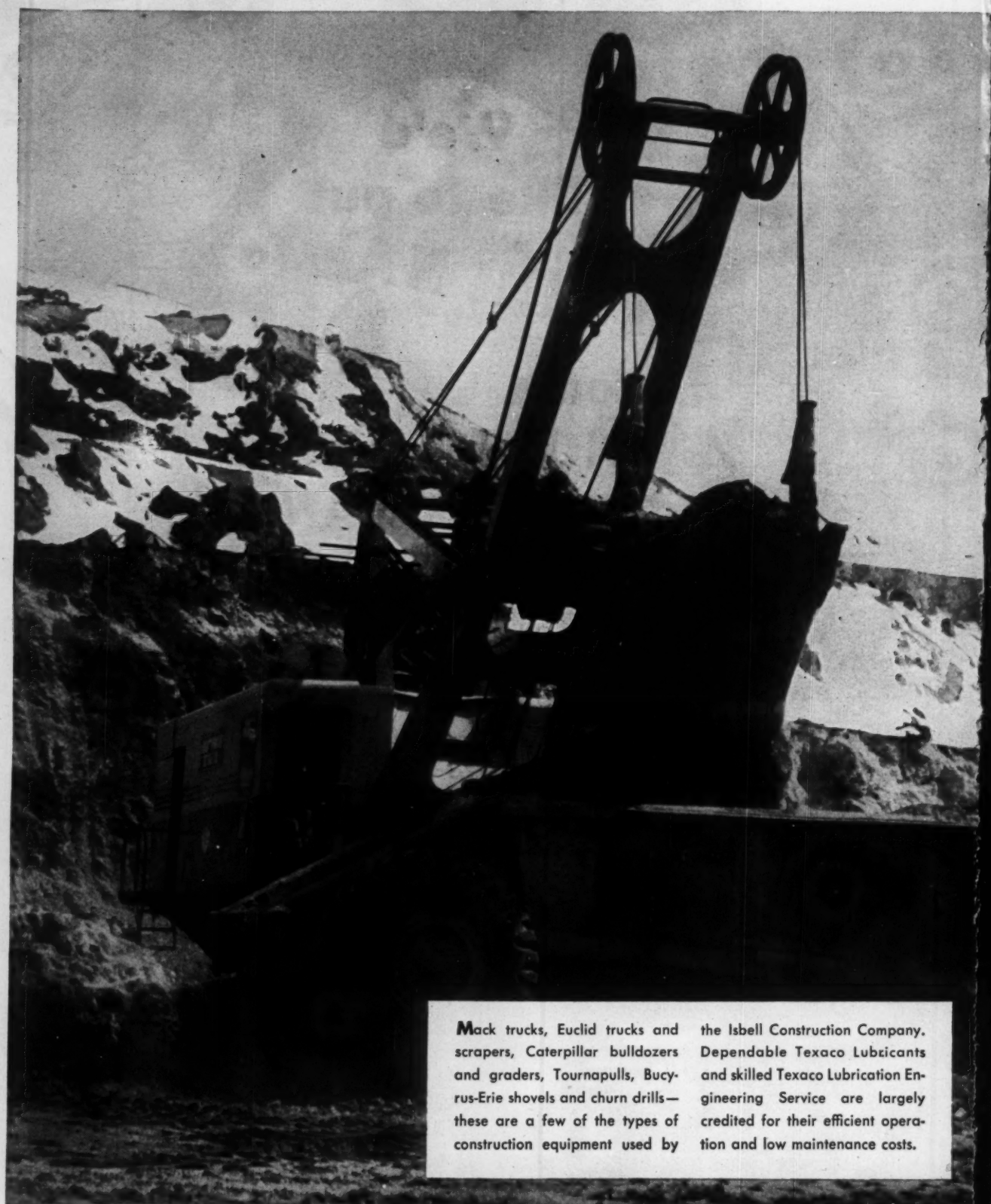


Mack trucks, Euclid trucks and scrapers, Caterpillar bulldozers and graders, Tournapulls, Bucyrus-Erie shovels and churn drills—these are a few of the types of construction equipment used by the Isbell Construction Company. Dependable Texaco Lubricants and skilled Texaco Lubrication Engineering Service are largely credited for their efficient operation and low maintenance costs.

TUNE IN...TEXACO STAR THEATER starring JIMMY DURANTE or DONALD O'CONNOR, on TV Saturday nights. METROPOLITAN OPERA radio broadcasts Saturday afternoons.

TEXACO

TEXACO

One of Nevada's biggest highway builders uses TEXACO SIMPLIFIED LUBRICATION PLAN

ISBELL CONSTRUCTION COMPANY, Reno, Nevada, not only is one of the state's biggest highway builders but does open-pit mining for some of Nevada's great copper mines. Operations on such a scale naturally call for millions of dollars' worth of equipment. To protect this huge investment, Isbell uses the Texaco Simplified Lubrication Plan because, the company says—

"With the Texaco Simplified Lubrication Plan we can handle all major lubrication with a minimum number of products. That keeps lubricant inventories low, reduces the chance of making lubrication mistakes, saves us time and expense on maintenance. And the smooth functioning of equipment is a big help in keeping our jobs on schedule."

Follow The Texaco Simplified Lubrication Plan

Contractors throughout the country find this unique plan eliminates lubrication errors, saves time and money. All major lubrication can be done with *not more than six* Texaco Lubricants:

1. **Engines:** Diesel and heavy duty gasoline engines run better when lubricated with one of the famous *Texaco Ursa Oil* series—a complete line of lubricants especially refined to make engines give *more power* with *less fuel* over *longer periods* between overhauls.

2. **Chassis:** Get longer lasting protection with *Texaco Marfak,* the lubricant that won't jar or squeeze out, that protects against dirt, rust and wear. *More than 555 million pounds of Texaco Marfak have been sold.*

3. **Wheel Bearings:** They last longer when lubricated with *Texaco Marfak Heavy Duty.* It seals out dirt and moisture, seals itself in—assures safer braking. No seasonal change required.

4. **Crawler Tracks:** Assure longer service by lubricating with *Texaco Track Roll Lubricant,* an effective guardian against dirt, water and wear.

5. **Air Compressors:** Clean and efficient operation is assured when you use the Texaco air compressor oil especially recommended for your particular operating condition.

6. **Rock Drills:** Get better protection against wear and rust with *Texaco Rock Drill Lubricant EP.*

Let a Texaco Lubrication Engineer help you simplify and improve your lubrication procedures. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

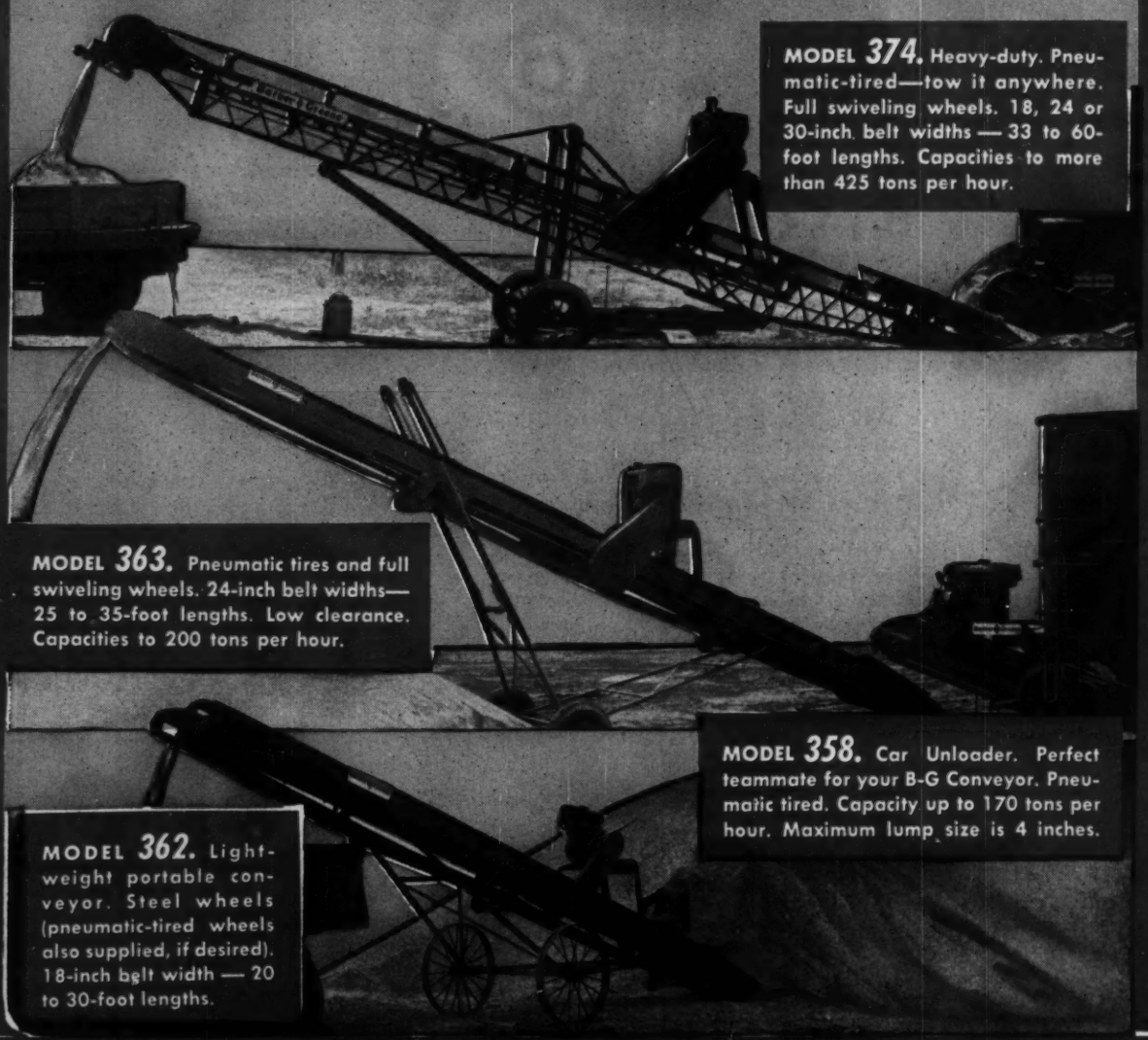
FOR ALL CONTRACTORS' EQUIPMENT

BARBER-GREENE HAS THE

PORTABLE CONVEYORS YOU NEED

Here are three standard B-G Portable Conveyors together with B-G Car Unloader . . . all available for prompt delivery from your B-G distributor. These skillfully designed and ruggedly built machines will—within the limits of their capacities—provide you with the most efficient and economical method of handling sand, stone, gravel, coal, coke, ashes, wet concrete, chemicals, bags and boxes.

In addition to the models shown, Barber-Greene also builds larger capacity portable conveyors. Why not check with your B-G distributor for complete information on portable conveyors?



MODEL *374.* Heavy-duty. Pneumatic-tired—tow it anywhere. Full swiveling wheels. 18, 24 or 30-inch belt widths — 33 to 60-foot lengths. Capacities to more than 425 tons per hour.

MODEL *363.* Pneumatic tires and full swiveling wheels. 24-inch belt widths—25 to 35-foot lengths. Low clearance. Capacities to 200 tons per hour.

MODEL *358.* Car Unloader. Perfect teammate for your B-G Conveyor. Pneumatic tired. Capacity up to 170 tons per hour. Maximum lump size is 4 inches.

MODEL *362.* Lightweight portable conveyor. Steel wheels (pneumatic-tired wheels also supplied, if desired). 18-inch belt width — 20 to 30-foot lengths.

Barber-Greene

BG

Aurora, Illinois, U. S. A.

Takes shortest route to job . . . via highway or cross country . . . cuts hours from job-to-job moves.

Drives through city without interference to traffic, turns sharp corners, maneuvers easily in tight quarters.

Safe in traffic with big brakes, finger-tip control. Tires do no damage to blacktop, curbs, sidewalks.

Saves hundreds of dollars

by driving job-to-job under own power

A major advantage of rubber-tired Tournatractor is the 19 mph on-the-job and between-job mobility it gives you. With this machine, you drive anywhere under your own power. Big low-pressure tires do no damage to pavement, curbs, sidewalks or railroad tracks. You don't need planking to cross blacktop. You save the time, bother, and expense of locating a trailer, moving in extra men and extra transport equipment, loading and unloading, etc., etc.

When it's time to move from one job to the next, your operator starts as soon as the last yard is in place, drives down the highway, right through regular traffic, at speeds up to 19 mph. 50 miles is only 3 hours away . . . and you go right to work when you get there.

Then, if there's a call for tractor services at the other end of your job, Tournatractor hurries there, traveling up to 1,670 feet per minute. Often it can go, complete the work, and be back at its starting point, before a crawler gets to the site.

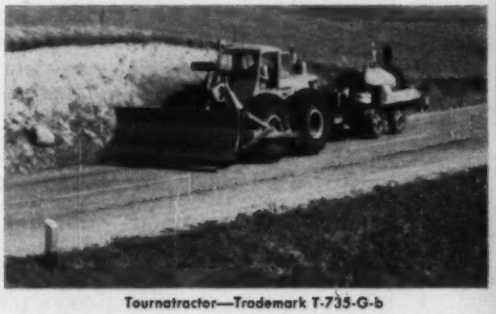
Figure out for yourself what this means in dollars:

1. Greater speed on the job that completes each assignment faster.
2. Roadability that cuts moving costs and reduces the non-pay hours of moving time.
3. Fast one-man moves that make it easy to keep Tournatractor profitably busy at all times, that let you fill in with small jobs between big ones with no stand-by losses.
4. Long range drive-yourself mobility and versatility that lets you move with the seasons, find year-round earnings when you need them.

Write or call us for more information on this versatile, high-speed tractor-on-rubber. Ask for a demonstration on your job. See for yourself what Tournatractor can do to speed your dozing, towing and pushing jobs.

Crosses tracks without damaging ties, tripping signals, tearing rails loose, or injuring tires.

Can haul own fuel wagon, other supplies. Self-sustaining on job, eliminates need for service trucks.



Tournatractor—Trademark T-735-G-b

FREE . . . A new 28-page book, showing all the ways Tournatractor will increase your production while lowering your costs. To get your copy, simply fill out coupon. Mail today to LeTourneau-Westinghouse Company, Peoria, Illinois. There is no obligation.

Send to: LeTOURNEAU-WESTINGHOUSE COMPANY, Peoria, Ill.

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T-735-G-b

"We always have a place for Tournapulls in our line-up,"

Says Project Engineer for S. J. Groves & Sons

To help move 3,000,000 cubic yards of fill for New Jersey's Garden State Parkway, S. J. Groves & Sons Company, Minneapolis, brought in a fleet of 3 Model D and 3 Model C Tournapulls.

These six rubber-tired units graded a section of the Parkway's south-bound lane near Atlantic City, then built a network of adjoining access roads. In 4 working months, they moved a total of 750,000 cubic yards. Most of this material was sand . . . almost all of it had to be hauled long distances. Yet, the job was finished well ahead of its 7½ month schedule.

"C's" complete 2½-mi. cycle in 13 min.

In typical operation — traveling 2½-mile cycles over narrow, twisting roads — each C Tournapull delivered 11 pay yards every 13 minutes. Output averaged 44 pay yards per unit per 50-minute hour . . . 462 pay yards per unit per 10½ hour day.

Project Engineer E. M. Smith estimates that on shorter hauls (up to 2000 feet one-way) each "C" moved 1,000 pay yards per 10½-hour shift — or about 95 pay yards per hour.

"D's" handle production earthmoving

Smaller 7-yard D Tournapulls worked right along with the larger machines, bringing in fill for new roadbeds. Push-loaded with 6 pay yards of sand and gravel, "D's" hauled at an average speed of 17 mph to complete 2½-mile cycles in about 10 minutes. In a 10½-hour day, each unit delivered 315 pay yards.

Operator Edgar Norton says of D Tournapull production, "When you looked at the fill our "D's" hauled and spread in a day, you sure could see that these rigs had really been on the move!"

Good for clean-up work, too!

Large enough and fast enough to work profitably in pusher fleets, "D's" can also self-load to economically handle scattered "one-man, one-machine" work. Groves' "D's" frequently worked alone on their Garden City contract, building up embankments to meet slope specifications. On 5100′ cycles on this work, each unit regularly self-loaded and delivered 5 pay yards of sand every 9½ minutes.

Project Engineer Smith is pleased with Tournapull production records on this and other S. J. Groves

Recently, Westinghouse Air Brake Company purchased from R. G. LeTourneau, Inc. their earthmoving and related products together with their Peoria, Toccoa, and Australian factories. Adding the high quality standards, precision manufacturing experience, and research facilities of Westinghouse Air Brake to the earthmoving developments of LeTourneau, gives you assurance that the improved line of equipment offered by this strong new company is the finest on the market. Be sure to check LeTourneau-Westinghouse before you buy.

The Garden State Parkway, extending the length of New Jersey from Paterson to Cape May, will provide a fast route to the Atlantic Shore resorts of New Jersey. Authorities estimate that in 1955, the first full year of operation, over 53,000,000 vehicles will use the road. Each of its dual bituminous concrete lanes is 24 to 36' wide, with 13 to 18' stabilized-turf shoulders and a 100' wide center island. Grades are limited to 3% in most places.

jobs. "We always have a place for Tournapulls in our line-up," he says. "From long experience we have learned they haul payload after payload every working day of the year."

Easy on your operators

One of Tournapull's most important advantages is its ease of operation. Simple fingertip controls are fast and easy to operate. Big low-pressure tires and comfortable air-foam cushioned seats eliminate much operator fatigue. It's no wonder that men on the job are so enthusiastic about Tournapulls.

Operator Philip R. Beane has nothing but praise for "a piece of equipment that provides the riding comfort that a Tournapull does."

"I suppose it's only natural for a fellow like me to be happy when he is assigned a Tournapull," says Elmer Knop. "We know that the power steering and fingertip control will mean a comfortable day and no aching back and arm muscles from steering."

R. E. Johnson concludes: "Construction days mean long hours but we don't feel it because every move is done by fingertip control."

Ask for a demonstration

By now, you've probably read quite a few statements like these on rubber-tired LeTourneau-Westinghouse equipment. Isn't it about time you checked what these machines could do on your job? Write or call us. We'll be glad to arrange a demonstration. There's a size Tournapull to fit your needs . . . 7, 16, and 22 yds.

"C", assisted by a crawler-tractor, loads 11 pay yds. of sand in 75 ft. Time: approximately 1 minute. In more than 3,000 hours of use, the 3 C Tournapulls used on this job have been 95% mechanically efficient.

Self-loading for half a minute heaps "D" with 5 pay yds. of loose sand. Groves officials estimate that on 5000-ft. hauls, D Tournapulls deliver 375 yards each in a 10½-hour day.

Production of Tournapulls in Sand . . . Figures Supplied by S. J. Groves officials

TOURNAPULL MODEL	AVERAGE LOAD*	CYCLE DISTANCE	PRODUCTION IN PAY YARDS	
			Per 50-minute hour	Per 10½-hour day
"C"	11 pay yds.	4,000 ft. (0.8 mi.)	95	1,000
"C"	11 pay yds.	13,200 ft. (2.5 mi.)	44	460
"D"	5 pay yds. Self-loaded	5,100 ft. (0.95 mi.)	26	275
"D"	6 pay yds.	10,000 ft. (1.9 mi.)	36	375
"D"	6 pay yds.	13,200 ft. (2.5 mi.)	30	315

*All loads obtained with help of 148 and 124 dhp push-tractors except as noted. D Tournapulls shown carry 7 yds. heaped, have 122 hp . . . "C's" shown heap 13½ to 14 yds., have 186 hp. "D's" now in production also heap 7 yds., have hp increased to 140. Present "C's" heap 16 yds., have 208 hp. New Model "B's" carry 22 yds. heaped, develop 290 hp.

Tournapull—Trademark Reg. U.S. Pat. Off. PDP-723-H

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

DON'T OVERLOOK JOBS THE AXIAL FLOW DOES BEST!

The axial flow fan design offers distinct advantages well worth considering for a growing variety of jobs:

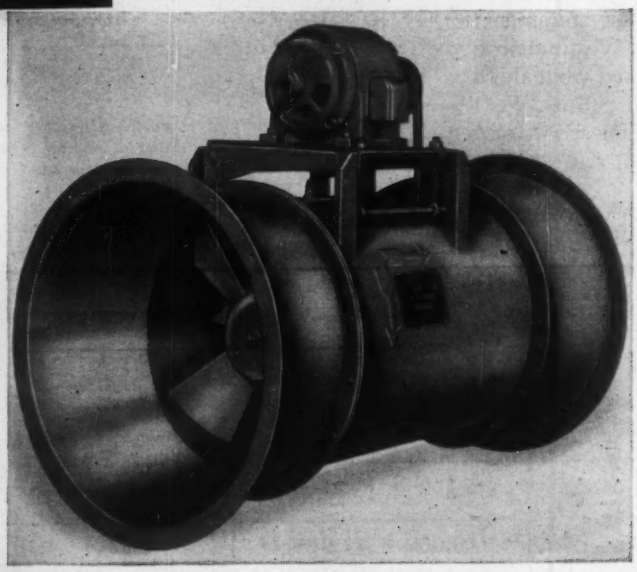
1. STRAIGHT LINE EFFICIENCY. Being basically designed for duct mounting, the axial flow is at its best when mounted in straight duct runs. "Buffalo" Axial Flows are giving excellent service as duct-mounted "boosters" in systems — also as light-duty ventilation, exhaust and industrial air conditioning supply fans.

2. LIGHT WEIGHT. This permits economical installation. In all but the very largest sizes, no heavy foundations or structural support are required. "Buffalo" Axial Flow Fans are often installed as part of the pipe or stack in hood and vat or other roof exhaust systems.

3. SPACE SAVINGS. These duct-size fans fit in close to walls or ceilings. Space-saving applications vary from paint spray booth exhaust to forced draft for cooling towers — from circulation of chilled air in quick freezing to boiler room cooling. Here, high efficiency influences the choice, as well as compact size.

Naturally, all axial flow fans are not alike. When you specify "Buffalo", you assure your customer the top performance inherent in the "Q" Factor*. Write today for Bulletin 3533-EF for full details.

NOTE: No one fan is the answer to every problem. "Buffalo" builds all types, including broad lines of centrifugal and propeller fans. Full details on request.



Right, "Buffalo" Type "B" Vaneaxial Fan. Outlet guide vanes smooth out air flow for greatest efficiency and quiet operation. Available for high or low temperatures, corrosive fumes, explosive atmospheres, etc.

"Buffalo"

**The "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.*

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READER COMMENT

No Proof of Bond Failure

SIR: After reading Zweig's letter in your Dec. 30th issue, p. 8, I have again referred to your Nov. 11 article regarding the failure of the rigid frame bent at the Naval Amphibious Base, Coronado, Calif., and would suggest that Zweig do likewise.

Therein he will see in the photograph on p. 38 that no reinforcing bars, partly or wholly pulled out of the concrete as with bond failure, are visible. He will also see in the left-hand figure, p. 36, that the bars in this unfortunate corner do not lap in their same respective planes but are shown with the down-turned ends of the two layers of horizontal bars completely separated from and inside the upstanding ends of the two layers of vertical bars.

Such positioning of bars, together with sharp 90-deg bends at a point of maximum stress, leaves much to be desired, as here demonstrated. The so-called "analogous" retaining wall (ENR Dec. 23, 1954, p. 6), is analogous in repeating, at least in the sketch, the error of offsetting the bars and not holding them in the same plane. Where such offsetting is shown merely for purposes of clarity it should be clearly noted and required that the bars actually be placed in the same plane. There is then no unexpected discontinuity in reinforcement, no unexpected variation in flexural strength.

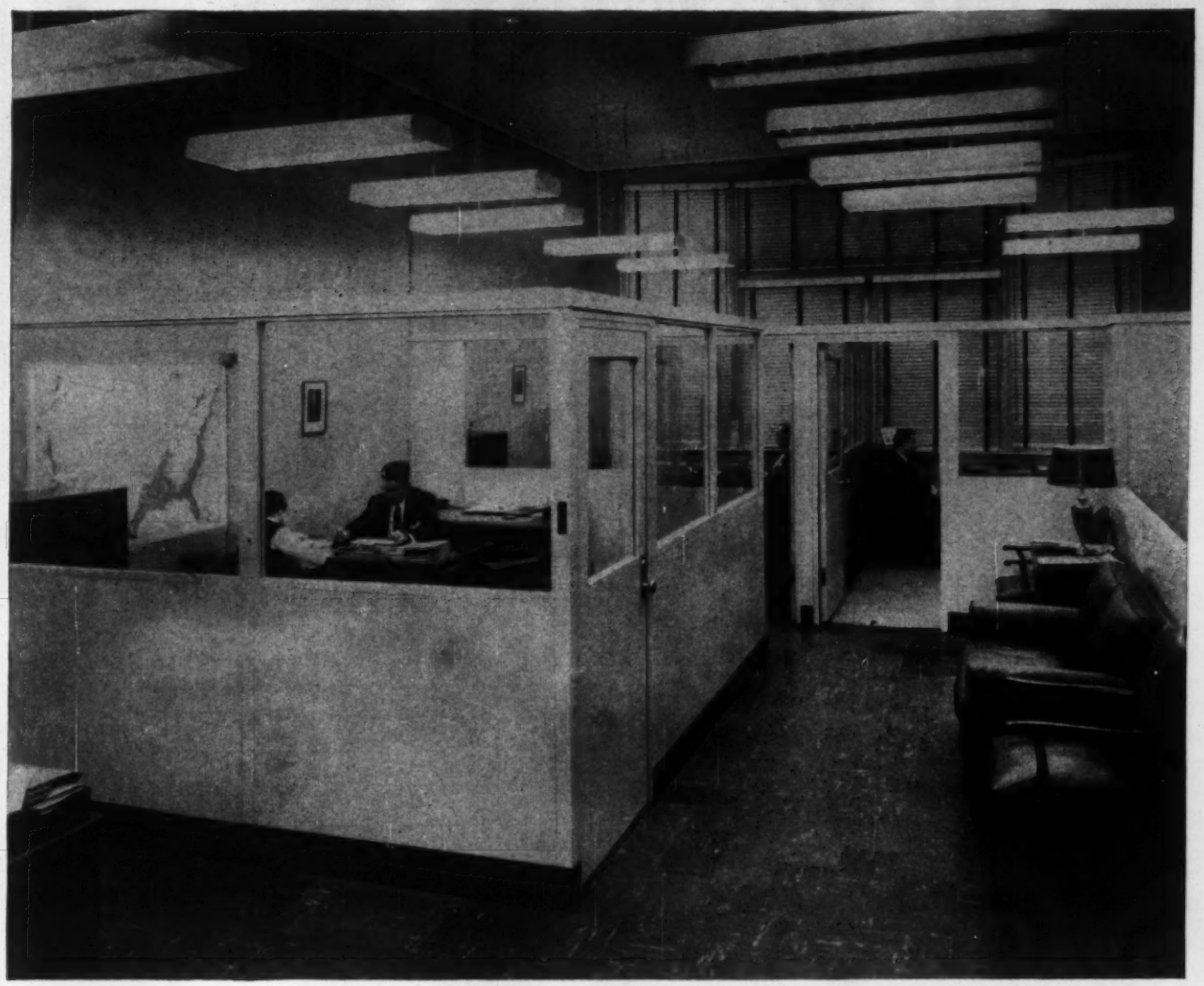
At all events it appears that the slip here, though plain and regrettable enough, is not to be attributed to ACI bond stresses.

HOMER M. HADLEY
Consulting Engineer
Hadley & Hadley
Seattle, Wash.

Denver Is Booming, Too

SIR: In your story on 1954 construction and 1955 prospects (ENR Jan. 6, 1955, p. 21), I note that you have failed to include Denver, which is probably comparable to Kansas City and is a much larger city than Omaha, both of these cities being contained in your report.

You may be interested in knowing that the valuation of building permits for the City of Denver for the full year of 1954 was $100,572,348, an increase of $7,400,000 over the 1953 figures. It is anticipated that dollar volume of construction will exceed this amount this year, as we are starting the year with one project, a com-



Installation: VMP MOBILWALLS for the Philadelphia Life Insurance Company at 111 N. Broad Street, Philadelphia, Pa.
Contractor: Fleming Company, 1717 Sansom Street, Philadelphia 3, Pa.

"VMP MOBILWALLS helped me meet a tight construction schedule"

Prompt delivery counts. This compliment from Charles J. Fleming, President of the Fleming Company, Philadelphia building construction firm, expresses the satisfaction that contractors feel when they deal with VMP. They can depend on fast deliveries. VMP MOBILWALLS always fit. No time is lost in erection with local VMP crews on the job.

VMP's metal movable MOBILWALLS slash installation time, keep that new look for years. Contractors everywhere are getting the word about the businesslike spirit behind VMP's erection and service crews. And warehouses have big stocks of metal MOBILWALLS available for immediate delivery.

Also, VMP works closely with the contractor . . . bidding with good sharp prices . . . giving expert attention to new and remodeling projects. Get the facts about VMP; write Dept. ENR-2 for VMP MOBILWALL catalog showing the variety of partitions available.

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ORANGE, VIRGINIA

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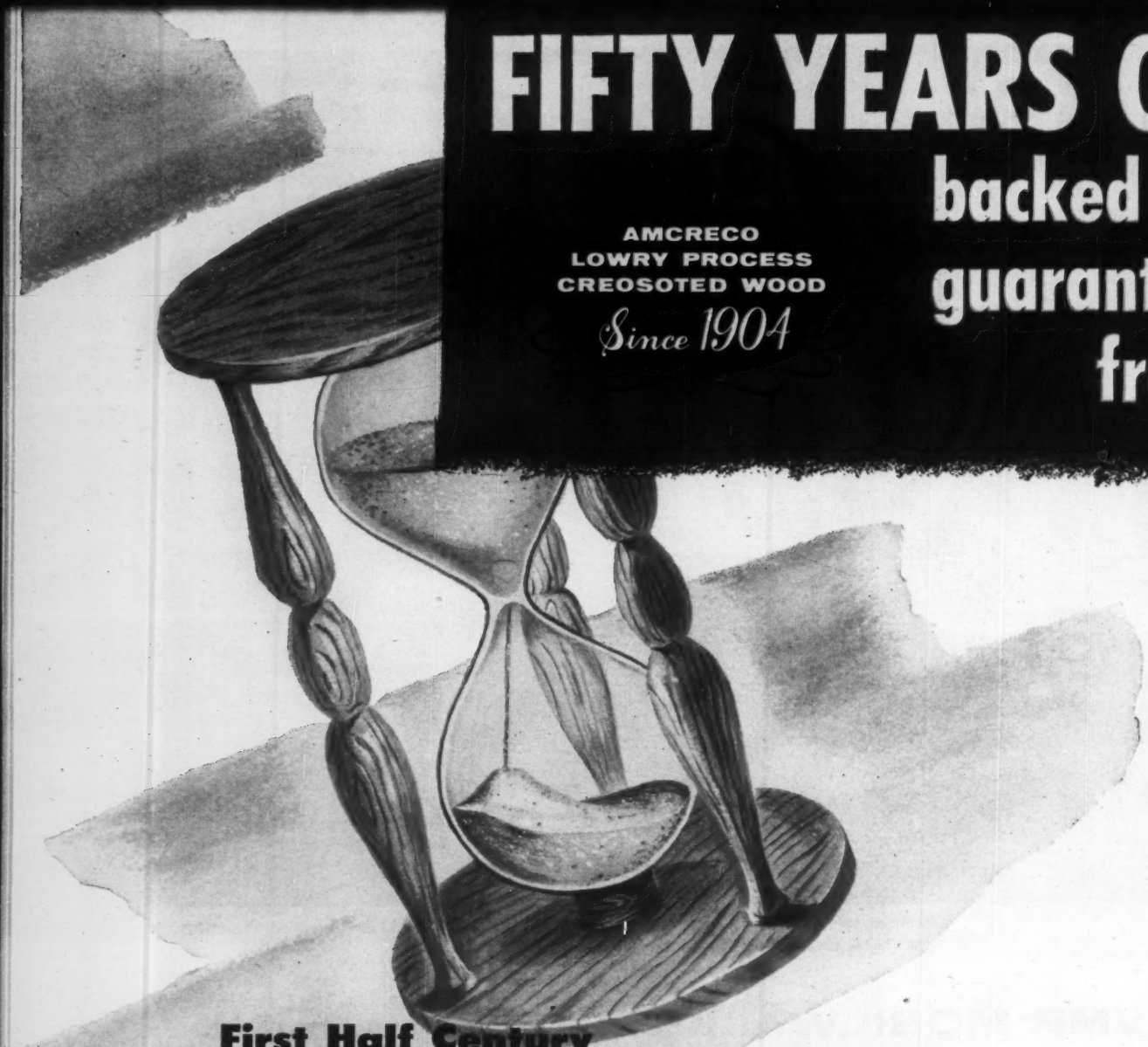
FIFTY YEARS OF backed by guarantee from

AMCRECO
LOWRY PROCESS
CREOSOTED WOOD
Since 1904



First Half Century of Modern Wood Preservation made possible by invention of the Lowry Process

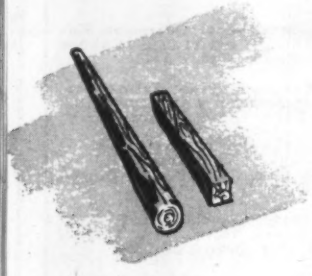
A little over fifty years ago in a plant at Shirley, Indiana, Mr. C. B. Lowry introduced his Empty Cell Creosoting Process to the world—an event that opened the door to the modern era of wood preservation and marked the beginning of success in man's age-old struggle to find a low cost wood preservative.

The Lowry Empty Cell Process opened the door to the modern era by making it possible to impregnate wood successfully with far less creosote and in far less time than was possible with the leading wood treatment process up to that time. The Lowry Process cut the cost of creosoting approximately in half and made it economical for the expanding railroad industry and other users of construction woods to take advantage of this service.

Lowry conceived the idea for his process about 1902, demonstrated it in an experimental plant for the Big Four Railroad at Riverside, Ohio in 1903, used it in commercial operations for the Big Four at the Shirley plant in 1904 and applied for a patent in 1905. The subsequent granting of patent rights, established Lowry as the father of the modern era of wood preservation.

PRACTICAL EXPERIENCE
continuous research and development
longer lasting wood products
American Creosoting Company

Out of the past . . . experience for the future!



● There is no substitute for experience. And the American Creosoting Company has over fifty years' experience in wood preservation. There is no substitute for pioneering spirit. And the spirit that led Mr. C. B. Lowry to invent his Empty Cell Process and found the American Creosoting Company is still very much alive.

For instance, the American Creosoting Company has carried on a continuous program of research and development throughout the years, both in its own laboratories and through research grants to leading universities. During this period, hundreds of chemical substances and processes have been developed and tested by Amcreco and other leading organizations in an effort to find new and better treating materials.

Despite these efforts and others, Science has apparently not yet been able to find a new material that equals creosote as a low cost chemical for prolonging the service life of poles, piles, timbers and other construction woods. *And longer service life is the first and most important reason why you invest money in treated woods. In general, any other feature that a preservative might offer is of secondary importance to its protective qualities.* One reason why creosote has been, and still is, the most effective preservative is the fact that it contains not just one but over one hundred toxic ingredients.

One other fact has become evident through years of research—there is still no laboratory short cut for determining the long range value of a preservative or process. The only real test is the test of how the preservative stands up on the job over a long period of time. Amcreco creosoted materials have undergone this test for over fifty years now, and their record is proven —long, long years of service with great strength throughout the life of the wood, and high resistance to fungi, borers, insects and all natural enemies of wood.

Of course, effective creosote treatment to a large extent depends on the method of application. There must be careful scientific control at every step in the pressure treating process. During application, the preservative must be measured by precise equipment, as it is forced into the wood. Final retention, distribution and concentration must be checked continually and accurately to assure the buyer the best possible product.

This is the type of treatment that assures clean, easy to handle construction woods that will last for years and years on the job. This is the type of treatment that takes the gamble out of purchasing. This is the type of treatment that you get from Amcreco.

Also in an industry where so much depends on service, Amcreco has had the time and experience to build up the facilities necessary to give you the kind of service you require. Our plants and sales offices are strategically located for prompt domestic or export shipment.

Write our nearest office for estimates or quotations on treated Timbers, Bridge Ties, Cross Ties, Piles, Poles, Cross Arms and Conduit. We would appreciate an opportunity to quote on your needs.

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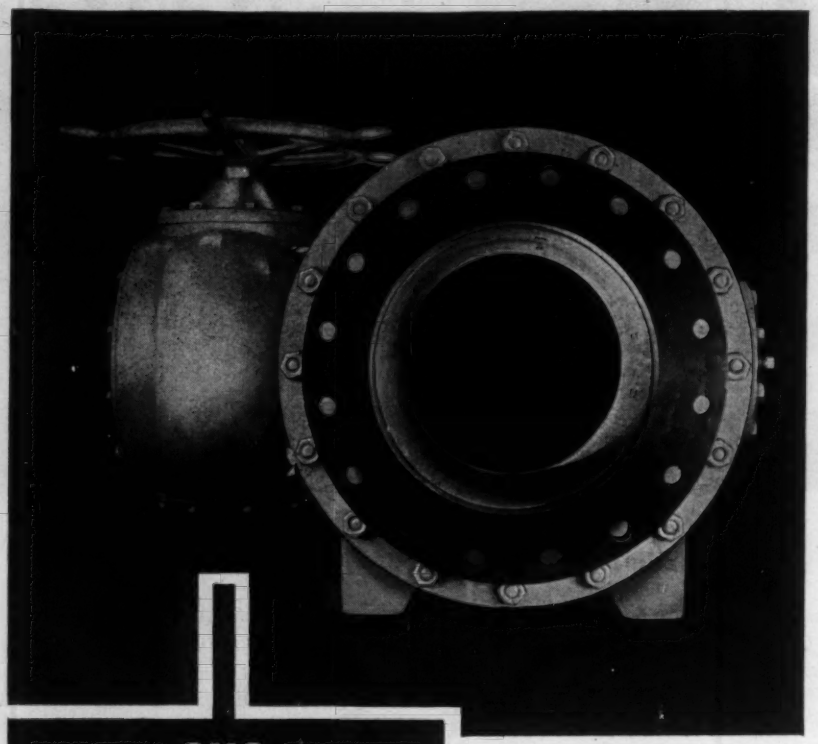

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BALL VALVES

a new achievement in valve performance . . .

STRAIGHT-THROUGH FLOW WITH DROP-TIGHT CLOSURE

For the path of least resistance—the new SMS-Ball Valve has no equal in design or price. When open, the valve is like a straight piece of pipe—nothing to resist flow and create resultant pressure drop, thereby reducing pumping costs. Elimination of turbulence adds to valve and pipe life.

EASE OF OPERATION—Forces required for opening and closing are remarkably low even under adverse conditions. The tremendous leverage exerted by the operating mechanism affords complete ease of operation. Flow velocity tends to ease closing.

TIGHTNESS OF CLOSURE—Drop-tight closure is obtained by the wedging action of the metal-to-metal seats.

SMS-Ball Valves afford high performance at significant in-place savings. Costs compared to valves giving similar performance are appreciably less. Write for our new Ball Valve folder.

This new valve, as well as our full line of cone and butterfly valves, is backed by over 75 years experience in hydraulic design and research. For full information on your valve problem, see your local representative, or write to S. Morgan Smith Company, York, Pennsylvania.

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Free-Discharge Valves
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READER COMMENT

bined hotel and department store with underground parking facilities, estimated cost of which is in the neighborhood of $20,000,000.

It may also be noted that the valuation of building permits for 1954 exceeded that of any city west of the Rockies, with the exception of Los Angeles. Also, while Denver ranks approximately twenty-fourth in population in the United States, the permit valuation in 1954 was around ninth in the United States. Taking in the metropolitan area of Denver, total permit valuation was around $193,000,000 in 1954, while population of greater Denver neared the 750,000 mark.

In view of the above figures it would seem that the Denver area merits some notice by your worthy publication.

F. W. DRANEY
Chief Building Inspector
City and County of Denver

Mackinac Bridge Engineers

Sir: In the list of engineers participating in the work on the Mackinac Bridge in the January 27 issue of ENR, p. 44, there was an inadvertent omission. Included should have been the fact that Walter E. Joyce, senior associate engineer on our staff, is in charge of cable design and erection.

D. B. STEINMAN
Consulting Engineer
New York, N. Y.

CALENDAR

Association of Highway Officials of the North Atlantic States, annual convention, Hotel Traymore, Atlantic City, N. J., March 2-4.

American Society of Photogrammetry and American Congress on Surveying and Mapping, consecutive meetings, Shoreham Hotel, Washington, D. C., March 6-12.

National Association of Corrosion Engineers, annual conference, Palmer House, Chicago, March 7-11.

American Concrete Pipe Association, annual convention and meeting, Sheraton-Plaza Hotel, Boston, March 9-12.

Associated General Contractors, Roosevelt Hotel, New Orleans, La., March 14-17.

New York State Association of Highway Engineers, Hotel New Yorker, New York City, March 23-25.

Southern Municipal and Industrial Waste Conference, College of Engineering, Duke University, Durham, N. C., March 31-April 1.

Regional Construction Conference, sponsored by the Cleveland Engineering Society, Cleveland, Ohio, April 11.

Concrete Reinforcing Steel Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., April 11-16.

ABOVE: View of girders on column tops and purlin framing in girders. Design live load, 30 lbs. per sq. ft.; column centers, 37′ x 33′. Girders, purlins and columns supplied by Alatex Construction Service Inc., New Orleans. AT RIGHT: General view of completed warehouse, dimensions 185′ x 266′. . . Consulting Engineer, Walter E. Blessey; Architect, George M. Leake; General Contractor, A and O Builders Inc., all of New Orleans.

50,000 SQ. FT. PRESTRESSED WAREHOUSE ERECTED IN 18 DAYS

THAT'S THE STORY of the new Myer Brothers Drug Company warehouse and office building in New Orleans . . . the entire framework including precast Perlite roof slabs erected in 18 working days. Both the 36-in. deep "I" section girders and the 22-in. deep "T" section purlins are prestressed with Roebling ⅜-in. diameter 7-wire stress-relieved strands pre-tensioned and bonded to the concrete. The prestressed members plus the precast reinforced concrete columns were purchased at an in-place cost of only 70 cents per sq. ft.

Roebling engineers, pioneers in the development of prestressing techniques and tensioning elements in America, will welcome the opportunity to cooperate with you to help assure maximum efficiency on any specific prestressed concrete application. Write Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

"Where are those re-bars?

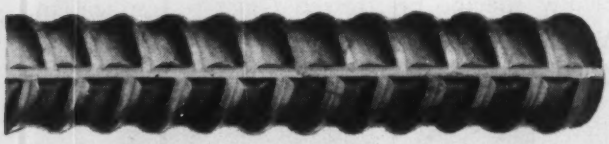
the boss should have ordered from Ryerson"

Re-bar deliveries delayed? Men and machines idle because of unreliable steel deliveries can mean the difference between a profitable or unprofitable job.

You avoid delays—and the inconvenience of having next week's steel piled up on the job site, as well—when you entrust your schedule to Ryerson reinforcing service. Ryerson has the world's largest steel stocks—the most extensive facilities—all smoothly organized to handle your requirements with absolute dependability. You set the schedule; Ryerson meets it, adjusting deliveries quickly to the progress of your project.

And, you can depend on the quality of re-bars from Ryerson, always. All are high-bond type, designed for greater grip and guaranteed to meet or exceed ASTM Spec. A 305. All are accurately cut and bent—tagged for quick placement.

So, for quick dependable deliveries of re-bars, wire mesh—every construction steel, contact your nearby Ryerson plant.



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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

TEST STRUCTURES—Construction men will have a special interest in that new series of tests the Atomic Energy Commission is running at Yucca Flats.

Several types of residences, new types of shelters, and steel and aluminum industrial buildings will be exposed to nuclear detonations for testing of blast, radioactivity and other effects.

LOCATION—It isn't ordinarily possible—and thus not legally necessary—to establish exact routes for highway programs before selling bonds to finance the projects.

So said Florida's Supreme Court, in answer to a taxpayer's suit seeking to force the State Highway Department to build a road around a bay, rather than a bridge across it, near Bradenton. "It is impossible to select a site or location for a major road or bridge that will satisfy all citizens. . . . Selection of locations . . . has caused more delay in constructing public improvements than any other matter," commented the court.

PARTNERS—Despite political setbacks last November on the issue, Oregon Republicans are still backing national Administration plans for "partnership" of private and public groups in power development.

Witness: The Republican-dominated state legislature passed two memorials to Congress, urging joint development of Green Peter and Cougar Dams in the Upper Willamette Basin, and of John Day Dam on the Columbia.

PIKE PROBLEM—Proponents of turnpikes and toll roads in Michigan are running into nothing but roadblocks. For instance: State Senator William Broomfield has introduced a bill to repeal the state's entire Turnpike Act (passed in 1952), writing off as a "mistake" the $500,000 already spent for preliminary surveys; other senators have voiced opposition to a plan to issue $13 million in promissory notes to pay for preliminary plans; many legislators say the Turnpike Authority is becoming too independent; the Detroit Parks and Recreation Commission rejected a proposed turnpike route through Rouge Park; the City of Dearborn has gone to court to prevent the Rockwood-Saginaw toll road from cutting through the center of the city.

TOWERS BACK—Aluminum Company of Canada has resumed production at its Kitimat smelter, after restoring electric power lines damaged in snowslides (ENR Feb. 17, p. 44).

Helicopters directed repair work on lines and aluminum towers, in rugged country.

Point to Remember
about Mortar

Why You Get Better Work at Less Cost with Lone Star Masonry Cement

● Good mortar goes hand in hand with good workmanship in good wall performance. Lone Star Masonry Cement assures uniformly highest quality, at lowest cost. Ask the Masons on well-designed Lakeland High School, Cortlandt, N. Y. It adds up this way:

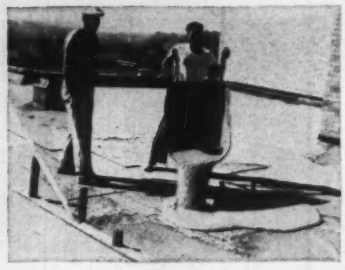
Saves Time at Mixing Box: No lime or portland cement to add, no soaking or slaking. One ready-to-use cementing material means one less variable in proportioning. Rigid control throughout manufacturing means uniform quality from batch to batch.

Saves Time on Scaffold: Extra fat mortar spreads easily, doesn't gum up the trowel, easier to tool, makes a neater job, with assurance of strong, permanent bond.

Assures Weather-Resistant Walls: No added waterproofing material needed; inherent water repellency and low absorption protect against weathering action. Chemical soundness safeguards against delayed expansion of joints, saves repointing.

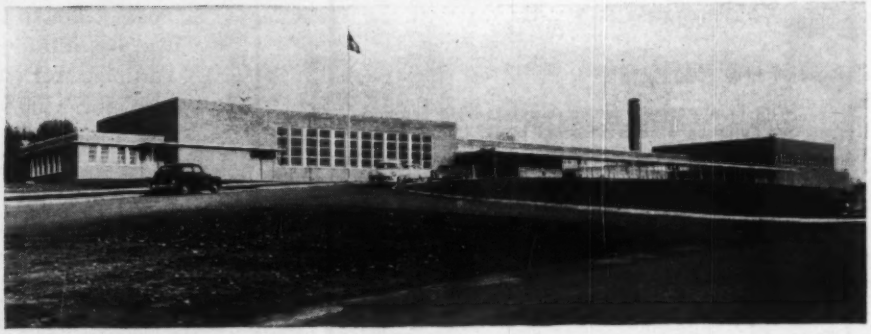
Non-Efflorescent: Lone Star Masonry Cement is practically free from salts; low absorption and high water repellency restrain leaching out of salts in water, sand or brick.

In a word, this is *Lone Star quality,* which means the highest attainable standards. Insist on Lone Star Masonry, the Cement that builds and holds good-will for the Designer and Builder.



For quality and economy, Lakeland High School has a lightweight roof-deck of high insulating value. The deck consists of 1¾ in. precast Porex insulating plank, with ⅜ in. poured-in-place, nailable, 'Incor'-Cement finish. Weight of 2⅛ in. roof deck is 7 lbs. per sq. ft., with insulating value equal to 1¼ in. cork.

LAKELAND HIGH SCHOOL
Lake Mohegan, Town of Cortlandt, N. Y.
Architect:
FREDERICK P. WIEDERSUM
Valley Stream, N. Y.
General Contractor:
STEWART M. MULLER, INC.
Croton-on-Hudson, N. Y.
Masonry Contractor:
WALSH & HAGAN, INC., Peekskill, N. Y.
Roofing Contractor:
PORETE MANUFACTURING CO.
North Arlington, N. J.
Lone Star Masonry Cement:
HOME BUILDERS SUPPLY CO., Peekskill, N. Y.



LONE STAR CEMENTS COVER
THE ENTIRE CONSTRUCTION FIELD

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 141,600,000 SACKS ANNUAL CAPACITY

WASHINGTON OBSERVER

Partnership construction of the Trinity River hydro project is recommended this week by Secretary of Interior McKay, on advice of Wilbur A. Dexheimer, Commissioner of Reclamation.

The project calls for two dams and four powerhouses which would come to a total of $220 million, if and when it all goes through.

Pacific Gas and Electric wants to build the power plants which could cost about $65 million.

Federal government's costs for the dams, tunnels, and the like would be reduced to $155 million, if partnership principle is applied.

PG&E says best use of power developed is to put it into their system which covers that part of California.

Dexheimer says Central Valley project would get the water it wants by the diversion of Trinity water to the Sacramento. It also would get the power it needs for pumping this water over the divide.

•

Dexheimer took himself off the political hook by saying that either partnership or all-federal construction "provides for continued expansion of irrigation" in the Central Valley. But he left it up to Interior Secretary McKay to make the recommendation to Congress.

McKay had to recommend combined public-private construction, however, since Administration policy is clear: Wherever private funds can be used to develop parts of hydro projects, they should be used.

•

The Air Force still wants its own corps of engineers. "Top-side," there is little friction between the Army Engineers and air installations officials bossing major construction at home and abroad, but base commanders and engineers working directly at individual airfields are having their troubles still. Both sides privately express a willingness to have Air Force construction personnel do Air Force building.

Some liberalization of what Air Force can build itself was made last year, so the Air Force could get practice for emergency, wartime construction.

•

Draft deferment for civil engineers working on defense jobs will continue under a reshuffle of the Labor Department's list of critical occupations. The entire list is being cut in half—a hint of a tougher deferment policy in the future. Civil engineers will still rate a one-year deferment, giving employers time to replace them. It will be harder, though, to get an extension. Non-professional construction workers do not get special treatment.

•

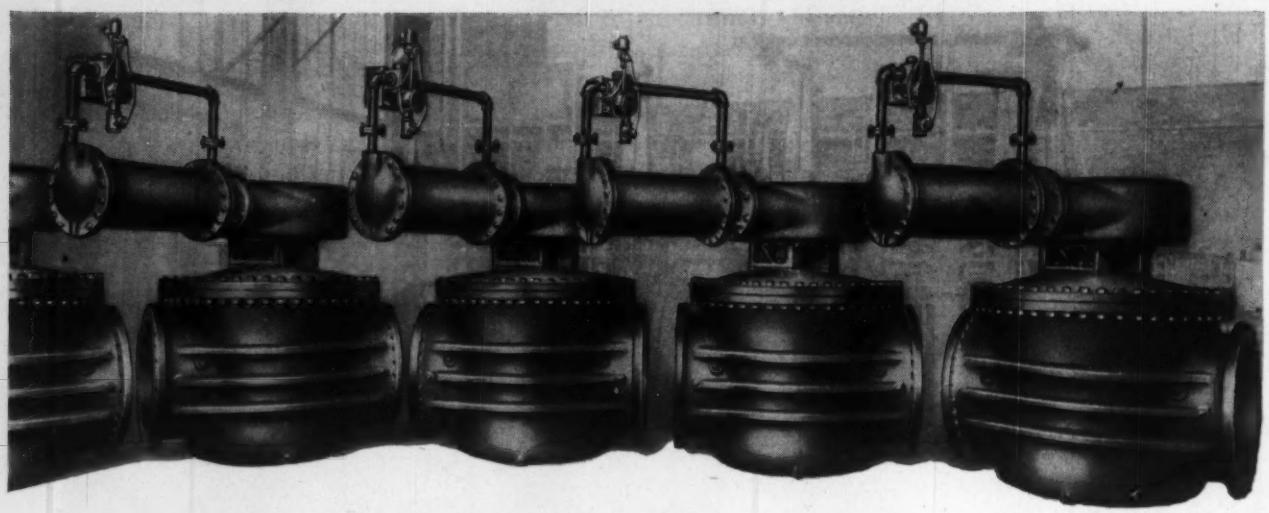
The next three weeks will see several Hoover reports affecting construction.

Medical services is due Feb. 28. It will bear on VA construction of hospitals, as well as on the President's proposals for building more nursing homes, and the like.

Lending agencies report, due March 7, would hit REA and Small Business Administration. This report will be searched for recommendations that could be construed as either critical or commendatory of the new Eisenhower lending proposals for schools and highways (see pages 23, 24).

Transportation report is due March 14—and it could have much to say about U.S. aid to airport construction, rivers and harbors, and the like. A special Cabinet committee on transportation should be out with a report of its own before this, however.

Reports on procurement, water and power, overseas operations will be coming in April and May.



36" CONE VALVES *with clear* OPENING

To supplement its hydro-electric power, TVA has built a series of steam plants on the Tennessee and Ohio rivers. These new units will furnish power required for Atomic Energy and other projects.

In this vital program, 52 Chapman Automatic Cone Valves were utilized for these plants . . . to act as check valves on the condenser water pumps. Each of these valves weighs approximately 11 tons.

Chapman designs and builds these valves in a range of sizes from 6" to 48" for check, throttling, pressure reduction and stop valve service. This is only one of many special Chapman valves. Remember, there's no problem in flow control that's too big or too tough for Chapman. That's why it saves time and money to *check with Chapman first, every time.*

The CHAPMAN VALVE
MANUFACTURING COMPANY
INDIAN ORCHARD, MASSACHUSETTS

After the Miami Honeymoon:

Labor's Merger May Stir Up a Family Quarrel

An ENR Staff Report

A number of points were beginning to come clear for the construction industry since marriage plans were announced for AFL to CIO:

• Trouble in making the two organizations work in harness—as the merger affects the construction industry—will be dictated by regional economics.

• The AFL's building trades probably will emerge as one of the two most powerful groups within the new 15,000,000-member federation.

• Practically all of the details that will be necessary to make the merger work will have to be worked out over a considerable period of time—there's nothing specific in existence at the moment.

• **Shotgun?**—Probably the most universal reaction to the announcement of merger plans at Miami (ENR Feb. 17, p. 242) was one of stunned surprise.

Leaders on both sides of the labor-management fence made it quite obvious that they hadn't really expected anything to happen at Miami—and they obviously hadn't been consulted on details.

Most responsible labor chiefs offered the opinion that such specific details will have to be worked out after the overall agreement, by long and laborious conference and discussion.

But, so far as points of conflict are concerned, it is clear enough that they will develop for the building trades in such manufacturing centers as Detroit and Pittsburgh but probably won't be of any consequence in New York City, for instance.

The reasoning is clear: New York has little major mass-employment industry, and the activities of the building trades seldom conflict with those of CIO unions. There are few, if any, instances where the question of bargaining rights involves the two groups.

In Detroit, however, where CIO-type unions dominate an entire plant, points of conflict are ready-made in matters of overall bargaining with management on general wage and welfare terms.

And in Pittsburgh and other steel centers, the long-standing fight of the building trades against force-account construction by members of the steel unions seem another ready-made sore point.

• **Power**—Biggest question mark, from the unionists' standpoint, is political power within the new federation.

Many observers believe the new setup means more power for the building trades. They see the construction workers as one of the two big units in the new federation—roughly as big and as powerful as the proposed new Council of Industrial Organizations, which will constitute what was the CIO (thus keeping its initials).

What the insiders think they see is more talking in top AFL councils by trades departments (such as building trades) rather than individual union chiefs. And, of course, there's the further point that president George Meany came up through the building trades himself (plumbers).

Anyway, it's not difficult to see why labor leaders down the line aren't entirely happy with the "marriage." Here's what some building trades men are disgruntled about:

• In drawing up the marriage terms, emphasis has been given to industrial organization: A CIO leader will handle the organizing department of the joint federation, and CIO unions will be given carte blanche for top to bottom organizing in certain areas. Some AFL crafts believe this may push them out of industrial plants where they are currently located, even though the agreement promises to keep the status quo.

• AFL craft unions, while working under an effective jurisdictional pact within their department, are far from settling their own problems. Opponents say the merger with the CIO will just add more troubles to delay settlement of their own disputes.

• Current conflicts between CIO unions and the AFL crafts will be emphasized by the merger. Right now, for instance, several craft unions and the CIO United Auto Workers are battling over 20 craft jobs at California plants of North American Aviation Co.

But so far, in the building trades, opposition to merger is not widespread. Federation headquarters has indicated no official dissatisfaction. It is watchfully waiting for final merger terms.

• **Future**—The next step is a joint constitution to be drawn up by Meany-Reuther teams. It is already agreed that it will contain a principle against raiding rival unions and enforcement rules against discrimination and racketeering.

There were Reuther principles, but he was forced to trade off his stand in favor of making raiding an outright violation. That was done to assure cooperation from Dave Beck's AFL teamsters—a Building Trades Department member—who refused to be a party to any enforceable pact and still has an eye on 50,000 members of rival unions.

But once this issue was settled, the rest was easy. And out of the agreement, Meany and Reuther feel they developed the best possible unity agreement. It shapes up like this:

• CIO officials will be given prominent posts in the new union, serving in jobs such as organization director, where they will be able to inject the enthusiasm and spirit of the CIO that still distinguishes it from the older and more settled AFL.

• CIO unions will move into the AFL federation in one group to be known as the Council of Industrial Organizations. This will be the industrial department but it won't be restricted to the CIO. The AFL machinists union already is talking of joining this department.

• CIO officials will hold 10 posts on the 27-man executive board. But more important, there'll be a new top policy group under Meany of six vice-presidents—three from the CIO including Reuther.

• The AFL gets the top positions. Meany will be president, AFL secretary-treasurer William Schnizler will keep that job.

• The merger, in effect, is the CIO unions moving back into the AFL. The name—American Federation of Labor—probably will be retained though the CIO is still bargaining to label the new union the "American Congress of Labor."

• Meany, whose views hue close to

. . . Labor

Reuther and CIO, will have his hand strengthened by their support. The federation will attempt to gain more control over their autonomous unions on such issues as welfare fund regulations and the elimination of internal corruption.

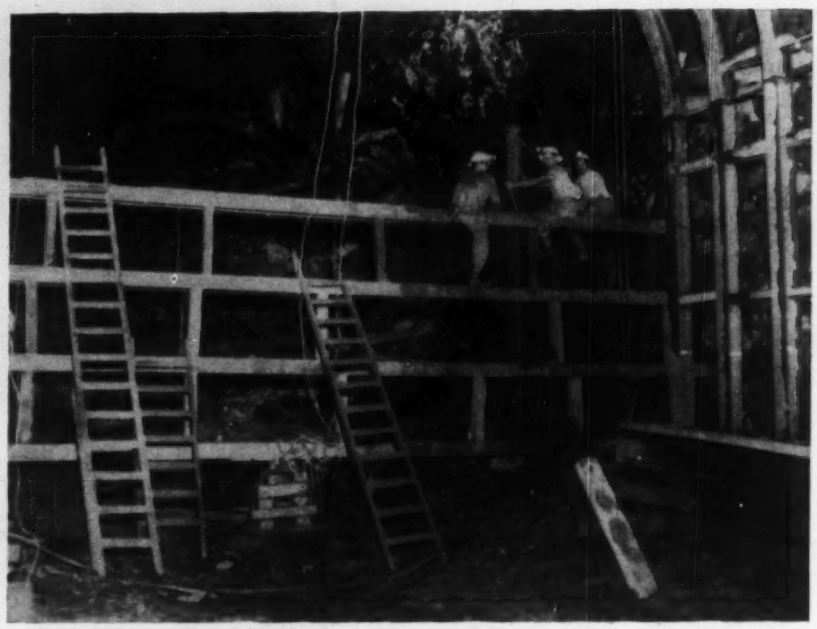
• **Problems**—End of raiding, racketeering, and discrimination won't come with the merger, due to be completed at a joint convention in September. Even the proponents say this will take years. The hope is that the atmosphere of the new union will slowly force the hand of violators to come around.

Another problem will be the integration of the two staffs. This will come most easily at national headquarters and most effectively—at the start—in a combinition of the AFL and CIO political arms. Labor lobbyists figure to carry more weight, both in Congress and in the state legislatures, by speaking as one voice for 15 million union workers. But they make no new claim about being able to deliver workers' votes, hoping only that the merger will make their words more influential.

State and local operations also will be joined. These branches, however, will have two years to complete integration in recognition of some differences in policy and operation. Little difficulty is expected. For example, in Tennessee Matthew Lynch, executive secretary of the CIO council expressed his views this way: "Actually both labor organizations have been working pretty well together in Tennessee all along. This has been particularly true on legislative matters. In a way, this merger will just be a change of name for us."

The AFL crafts will be watching the influence of steelworkers' president David J. McDonald, who probably will hold a policy post in the new union. It was McDonald, incidentally, who brought about the merger at this time through his rivalry with Reuther.

McDonald, in protest against Reuther's CIO leadership, had threatened to pull his union out of the organization. He probably would have done so if Reuther, with his hand forced, had not obtained the best deal he could. Now he's a staunch supporter. When CIO executive vice president John V. Riffe last week told the TWU convention he could not go along with the merger, McDonald disavowed any sympathy for Riffe's views and replied: "These opinions are the opposite from the official position of the steelworkers."



Honolulu Plugs Wilson Tunnel

Steel and concrete bulkhead 1,800 ft from tunnel mouth will block off soft earth area where 3 cave-ins occurred

Workmen have started to plug the bore of the Wilson Tunnel in Honolulu where cave-ins caused the deaths of five men Aug. 14 (ENR Aug. 19, 1954, p. 28).

Steel and concrete placed 1,800 ft from the tunnel mouth will form a concrete bulkhead 3 ft thick, blocking off the tunnel's cave-in workings.

About 1,500 yd of concrete will be force-pumped back of the bulkhead to fill the space between the tunnel ceiling and the debris left by the cave-ins. The plug will prevent more rockfalls and cave-ins in the area excavated until a plan for completing the rest of the 2,776-ft bore is agreed on.

E. E. Black, Ltd., the contractor who carried on the tunneling work, recommended the plan to plug the bore, and engineers of Honolulu city-county agreed. The plug, to cost $40,000 to $50,000 will be drilled and blasted within the tunnel perimeter when construction begins again.

Heavy rockfalls from the ceiling of the "safe" area, about 1,800 ft from the tunnel mouth, prompted the decision to place the concrete plug. It was at about that point that construction moved from rock to soft earth, and three cave-ins occurred.

Honolulu tentatively has adopted the recommendation of Dr. Karl Terzaghi, Harvard University expert, that it dismiss the E. E. Black contracting firm and complete the tunnel by a drift method.

E. E. Black, however, has urged that his firm be allowed to complete the project by an open cut from the opposite end. An open cut, he said, could be made both for the roadway which is under construction at this time and also for a planned second parallel tunnel.

The Black proposal also suggests that part of the open cut be decked over. This would permit steeper excavation slopes because the covered roadway would be impervious to minor rockfalls and slides.

National Housing Center Will Include Big Library

One of the world's largest and most complete libraries in the building field will be a feature of the new National Housing Center, now under construction in Washington, D. C. Atlantic Research Corp. has been hired by the National Association of Home Builders to set up the library and the Alexandria, Va., consulting firm already is developing some basic ideas from the big building information centers of Europe.

Although it is intended to serve the needs of the more than 33,000 NAHB members, the library also will furnish information to industries related to homebuilding. The eight-story center will house a permanent exhibit of building materials as well as offices of the NAHB and the National Research Institute.

Battle Joined Over Rival Highway Plans

President Eisenhower's program, conceived in the President's speech last summer to the Governor's Conference at Lake George, N. Y., went to Congress this week.

On hand, too, for congressional consideration was the Democratic party's answer embodied in Sen. Albert Gore's proposal to expand the existing federal-state matching fund program.

What finally will come through the congressional mill and win White House approval is anybody's guess. But a stepped-up highway construction program of some sort seems assured.

President Eisenhower took every precaution and made every effort to get substantial backing for his highway program. He delayed his message to Congress for weeks in an effort to build an unassailable program. Then he invited congressional leaders to the White House to hear his explanation of the program the day before he sent the highway message to Congress.

The President's White House conference took place only hours after the Senate Public Works Committee had opened hearings on the Gore bill which calls for federal highway aid of $1.6 billion a year.

• **The President's program**—The Administration plan was quite different. The White House plan followed the general principles of the special study committee headed by Gen. Clay.

In his message to Congress, the President endorsed the recommendations of the Clay report—but without committing himself on every detail.

He recommended that the federal government assume the job of building the $25-billion interstate highway system in 10 years, financing the work with tax anticipation bonds that would be retired within 30 years out of federal revenues from present highway user taxes.

The President indicated he is ready to discuss how federal aid for other systems should be adjusted to fit the changed picture resulting from federal assumption of the entire interstate highway building job.

In general, he backed the recommendations of the Clay committee that federal-aid authorizations should be cut back to $600 million by eliminating the $175 million for interstate highways included in the 1954 Highway Act's total of $875 million.

On the contentious question of federal reimbursement to the states for future toll roads that they might build as parts of the interstate system, the President leaves the decision for Congress to make. Similarly, on other details, he proposes that the problems be settled by the legislators.

But on the two major propositions—that the nation face up to its immediate need for construction of an integrated highway system and that the federal government complete the entire interstate network quickly through sale of special highway bonds—Eisenhower was direct and forceful. He stressed the defense importance of the interstate roads and pointed out the necessity of putting these routes in shape for any emergency.

• **Democrats object**—Democratic leaders will not be won over easily to support of the White House program. With an eye on next year's elections, they still demand that funds for federal expenditure be voted by Congress and show up in the budget. They stick with the Gore bill as the time-tested method of meeting a big problem.

Administration leaders like Du Pont, now on the firing line as special consultant to the Commerce Secretary, decry the Democratic approach as providing too little and too late. It would take 32 years to complete the interstate system under the terms of the Gore bill, these leaders declare.

More realistic, even if not ideal, they contend, is the President's plan for constructing the interstate roads in 10 years by financing the work outside the budget through a special highway corporation.

But Democratic Senators Gore and Chavez, who will have a big part in any road legislation that goes through Congress, remain critical of important parts of the Administration program.

The issue is joined in Congress. The politics of the 1956 elections loom large in the picture; and they dim the chances for the bipartisan approach that Eisenhower had hoped to gain.

FHA Screens Apartment Loan Applicants

New procedure designed to expedite clearance of sponsors whose records indicate no evidence of windfall profits

The Federal Housing Administration this week instituted a blanket procedure to bar further FHA loan insurance for sponsors who took windfall profits out of past multi-family projects—particularly those built under Section 608.

At the same time, the new machinery is designed to process quickly those firms and individuals whose records are clear.

Starting this week, every applicant for an insured loan on a proposed apartment project must fill out two new forms. One calls for certified listing of previous participation in any such FHA projects.

The second requires an itemized report on total costs and mortgage amount for each project, showing if the loan exceeded the cost total and what was done with the surplus.

This information lets the FHA field offices make a quick, preliminary separation of applicants who are in the clear. If nothing adverse shows up in the certified data, the office goes ahead with processing of the application while the information is being reviewed. Where there is evidence of illegal or unauthorized action in the past, FHA will hold up processing until the status of the applicant has been determined.

The new procedure is expected to open the door to many sponsors who have been under a cloud as a result of FHA investigation of Section 608 projects. FHA had attempted to clear a few of the 308 names—firms and individuals—on the list compiled by its investigation staff, but the Justice Department balked at letting the agency do business with anybody on that list.

Information required on the new "previous participation certificate" covers all types of multi-family housing, including military (Wherry Act), defense, and regular FHA projects as well as Section 608. But the new procedures do not apply to the individual home buyer who seeks an FHA-insured mortgage.

Suit Charges Gross Neglect In Arbitration Board Award

The Florida State Road Board has filed a suit in Jacksonville charging "gross neglect and/or misbehavior" in a Florida arbitration board's award of an extra payment to Merritt-Chapman & Scott Corp. for construction of the John E. Mathews Bridge in Jacksonville (ENR Jan. 27, p. 25).

The arbitration board awarded the construction firm an extra payment of $298,274 on the grounds that preliminary borings were inaccurate and caused delays in construction.

The State Road Board has refused to make payment of the sum awarded. The date for hearing of its suit has not been set.

School Plan Hit

Critics say President's program has "too little aid, too much control"

President Eisenhower's school construction proposals are likely to get a thorough overhaul in Congress with the result that the federal government will foot a larger part of the bill for schools than the President suggested.

In congressional hearings, the President's program was roundly criticized by state school officials, architects and teacher groups as well as by Democrats. Critics charged the Administration plan to stimulate $7 billion of school construction during the next three years offers "too little aid and too much federal control."

Most of the witnesses before the Senate Labor Committee made clear their preference for a program of federal aid similar to the one proposed by Sen. Lister Hill, chairman of the committee. The Hill bill would provide $500 million of federal money in each of the next two years for grants to be matched by the states.

Dr. William G. Carr, executive secretary of the National Education Assn., summed up the criticism of many educators. He said the Administration would have to rewrite its bill completely in order to get schools built. "And I don't want to give the impression that a little tinkering will fix it up," he added. "Unless the bill is amended to remove unnecessary restrictions and controls, the NEA must oppose it."

Lee Cochran, Chicago architect, testified that the American Institute of Architects "foresees a considerable waiting period" before "we as architects will be supervising construction of school buildings."

The hardest-hitting testimony against the bill came from Dr. Edgar Fuller, executive secretary of the council of chief state school offices. Dr. Fuller questioned the Administration claim that the bill could stimulate $7 billion worth of new construction during a three-year period.

"This is not a $7-billion plan as widely advertised," Dr. Fuller asserted. "The total federal grants and loans would at their peak be only a small fraction of that amount."

Dr. Fuller called the bill "a banker's bill," saying, "it's written in the tone of a mortgage banker lending money to a pauper and wanting to tie him down solidly to make sure he gets back every penny—plus interest."

Major attacks were made against Title Two—the heart of the Administration bill. It provides for the government to contribute roughly $150 million to help states set up state building authorities that would issue bonds, build schools and rent them back to school districts on a lease-purchase program.

The government advance, to be matched by the states, would guarantee bond holders their interest. The monthly rentals would cover principal and interest and build up a permanent reserve to replace the federal government's funds within a few years.

Witnesses said every attempt to set up state authorities would be subject to court tests. (The four existing authorities in Maine, Pennsylvania, Georgia and Indiana all have been brought into state courts on constitutional tests.)

One Administration witness, Orrin G. Judd, partner in the New York law firm of Goldstein, Judd and Gurfein, testified that constitutional tests could be avoided if the state legislation setting up the authorities were properly drafted.

Dr. Fuller and others charged that this was an attempt to circumvent state constitutions.

"The best that could possibly be said for Title Two," said Dr. Fuller "would be that it might be amended and made into a long-range plan of some kind which could become generally effective five or ten years from now."

Even as a long-range program, Dr. Fuller said that most of the chief state school offices would oppose it because "it would set up separate state agencies, because it would be too expensive and because it would be an example of federal discrimination against schools in contrast with generous federal grants to highways, hospitals and other physical facilities in the states."

The grant program under Title Three was attacked as inadequate. Most witnesses concurred that the $200 million provided over a three-year period would not be enough to provide the emergency relief needed.

Engineers Approve Plans For Dam Near Seattle

A board of consulting engineers has approved plans for construction of a $4-million water storage dam on the Tolt River 30 mi from Seattle.

The dam would be an earth-fill structure 170 ft high and 1,000 ft long. The proposed site was endorsed by Dr. Howard W. Coombs, executive officer of the Department of Geology at the University of Washington; Sterling Hill, retired engineer of the Bureau of Reclamation, and James Patrick, soil engineer with the Corps of Engineers.

Plans call for completion of the Tolt River dam by 1960.

C. B. Burdick Dies

Chicago consultant made notable contributions in water supply, filtration

Charles B. Burdick, nationally known hydraulic and sanitation engineer and partner in the Chicago consulting engineer firm of Alvord, Burdick & Howson, died in Chicago last week at the age of 80.

It was 43 years ago that Mr. Burdick designed the original Niagara Falls filtration plant, which by treating water polluted by the sewage of Buffalo, N. Y. was one of the first to demonstrate the effectiveness of filtration in reducing the incidence of typhoid. In the years following, his office designed more than 100 filtration plants including notable projects in Chicago and Milwaukee.

Treatment of water for purity and softness was one of Mr. Burdick's major contributions in the field of water supply. His name is connected with important water supply developments in Louisville, Ky., Des Moines, Iowa, Miami, Fla. and Denver, Col. He did the preliminary plans and estimates for the supply of nine cities on the east side of San Francisco Bay, in which mountain water was impounded and carried across the San Joaquin Valley.

He authored the expansion programs for municipal water works and the rate structures to support them for a host of cities.

Flood control was another field that occupied Mr. Burdick's attention during his long career and he served as consultant on a number of flood relief projects in the Midwest and South.

His development of the fundamental principles involved in the collection of underground water, as exemplified by the country's largest infiltration galley installation at Des Moines, is regarded as a foremost contribution to engineering.

Mr. Burdick went to work for the late John W. Alvord in 1895 and was associated with him until Mr. Alvord's death in 1943. Their partnership was formed in 1902 and in 1922 the firm became Alvord, Burdick & Howson.

A frequent contributor to engineering literature during his nearly 60 years as a consultant, Mr. Burdick in 1918 co-authored the book, "Relief From Flood" with his partner, Mr. Alvord.

A native of Chicago and a graduate of the University of Illinois, Mr. Burdick took an active part in professional society activities. He was an honorary member of both the American Society of Civil Engineers and the American Water Works Assn.

N.Y. Air Terminal

Authority announces plan to invest $60 million in International Airport

The Port of New York Authority has announced a $60-million air terminal development program at its 5,000-acre New York International Airport. Construction is slated to start this fall.

The authority presented the plan as the result of years of study by its engineering staff and consultation with international air terminal experts.

International is primarily a destination and origination facility, with only 15% of its air travelers changing flights en route to other cities. For this reason, a one-building installation was considered inadequate because of long passenger and baggage travel distances. A multi-building terminal area was decided on as the only satisfactory solution.

Ten separate passenger structures will be constructed on the perimeter of a 655-acre, oval-shaped area centrally located in the airport tract. They will face a landscaped 160-acre plaza containing a half-mile-long lake, a pond and the control tower building. The dominant structure in the development will be a $15-million International Arrival Building for which $2 million has been budgeted for 1955 expenditure.

This building will have two adjacent wing buildings extending over a straight-line distance of 2,200 ft., and will provide—in three stories—all services and facilities for incoming trans-ocean passengers. The wing buildings, which will accommodate outbound passengers, have been so designed that expansion of facilities may be gained by extending the wings at either end.

• **Separate terminals**—The plan also calls for seven separate terminal buildings for U. S. airlines to be constructed at an estimated cost of $30 million. Built by the Port Authority according to plans submitted by the operating airlines and approved by the authority, each terminal will be a complete, line-operated entity. Revenue will be collected in the form of rents.

All buildings, including the International Arrival Building, will be framed with structural steel, according to representatives of Skidmore, Owings and Merrill, designers of the main structure. Identical design for individual line buildings will not be required, but all must conform to the basic design. Layout will be dictated by operations of occupying airlines.

Completion—in four to five years of the entire program of construction—will provide a total of 140 aircraft positions. Each of the seven separate terminals will have space for as many as 16 planes.

• **Site development**—Installation of roadways, taxiways, aprons, landscaping, utilities and parking areas will cost the remaining $15 million. Parking areas adjacent to the separate terminals will minimize walking distances.

The main access road will be carried under the parallel one-way taxiways that will encircle the terminal area. Once inside the area, grade separated loops will provide access to four quarters of the area.

Among consultants present during the announcement were Sir Alfred le Maitre, airport chief of the British Ministry of Transport and Civil Aviation; Louis Couhe, chairman of the board of directors, Paris Airport Authority and John A. Casey, superintendent, airport operations, Chicago Midway Airport.

Design consultant and coordinator of exterior architecture of the terminal plaza, landscaping and buildings is Wallace K. Harrison. Fred M. Glass is the Port Authority's director of aviation.

N. Y. Building Design Aims At Interior Space Economy

An unusual office building design to provide greater interior space economy and flexibility is planned for the 36-story, $40-million skyscraper to be erected at 666 Fifth Ave. in New York City.

Tishman Realty & Construction Co., Inc., builder-owner of the structure, said that the new building will incorporate the extra wide 6-ft windows with narrow 2½-ft piers between the windows instead of customary 4½-ft windows.

This plan will produce a double module and make possible a greater variety of practical room sizes than can be obtained with the usual window. It will produce room divisions of 6 ft, 8½ ft, 11 ft and 13½ ft as against the 4½-ft module which produces 9-ft rooms as its smallest practical division.

The building also will feature an "open" colonnaded street floor with a 30-ft-wide arcade running back 100 ft from Fifth Ave. to the lobby and two other arcades leading from the 52nd St. side to the lobby.

The skyscraper will provide 1,000,000 sq ft of floor space. It will have a 16-story base occupying the entire 60,000-sq ft plot and a 20-story tower. Demolition of buildings now on the site will begin next summer. Completion is scheduled for the summer of 1957.

Carson & Lundin, New York, is architect for the building.

Concrete Acts Up

Laboratory study shows that chemical reactions caused strength to vary

Concrete in the foundations of the Commodore Perry Houses under construction in Buffalo, N. Y., continues to act strangely.

Previously reported to be losing strength with age (ENR Dec. 2, 1954, p. 25), the concrete now appears to be developing strength abnormally, even with decreasing atmospheric temperatures. So preparations are being made to continue construction which had been halted pending investigation of the low strength.

The project will consist of six 8-story buildings, containing 383 low-rent apartments, and several two-story buildings with 100 units—all of reinforced concrete construction. It is being built for the Buffalo Housing Authority.

Last fall, routine cylinder tests were made of the concrete, indicating that about 7% or 8% of the specimens were below the required 3,000-psi strength. As a precaution, cores were taken about 40 days after the tests to see if the concrete had reached design strength in the interim. Surprisingly, the cores broke at lower stresses than the cylinders.

Tests of the cores and of the concrete-in-place with a Swiss hammer (which incidentally showed excellent correlation with core tests) indicated that strength conditions throughout the structure were spotty.

A report by Gulick-Henderson Laboratories, Inc., Flushing, N. Y., following an investigation, concluded that the low compressive strengths attained by the concrete "were caused by a chemical reaction between the component materials used in the concrete." Probable villain, according to the laboratory's studies, was the high sulfate content of the slag aggregate used in making the concrete.

One explanation offered is that originally hydration of the cement proceeded with little or no abnormality. So the cylinders showed normal strengths. Sometime during the hydration, the excess sulfate reacted with the calcium aluminate of the cement to produce calcium sulfo-aluminate, with an increase in volume. The disrupting effect of the expansion caused a loss of strength.

However, when the excess of sulfate was consumed, continued hydration of the cement enabled the concrete to gain strength. Variations in sulfate content of the slag, it is believed could account for the variation in strength observed in the structure.

Texas Toll Roads

Contract letting begins and construction starts on three toll highways

Toll-road planning in Texas has risen to fever heat. Within the past few days the two private organizations holding charters to build long toll highways in that state—the Texas Turnpike Co. and the Sam Houston Turnpike Corp.—have announced that bankers have agreed to take their bonds and that bids have been received on the first construction contracts. Initial offerings of bonds and actual construction will take place this month.

Reason for these sudden spurts of activity after a long period during which little happened is a clause in the law setting up the Texas Turnpike Authority passed by the Texas Legislature in 1953. That clause said that the authority must not make plans for toll roads along routes covered by the charters of the two private companies until 18 months after the effective date of the act, which was Aug. 26, 1953. The 18 months will be up on Feb. 26.

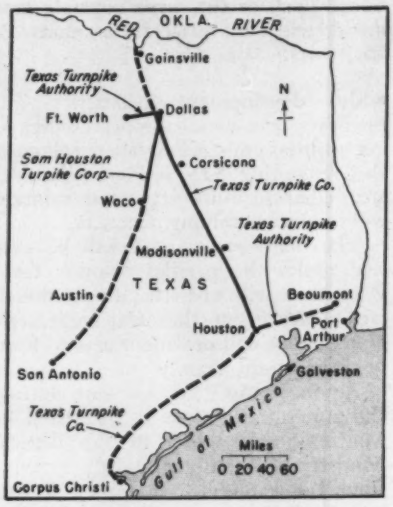
After that date the Texas Turnpike Authority can begin to plan actively to build toll roads along any route that appears attractive. At present it is concentrating chiefly on its plan to build a toll-highway link between Fort Worth and Dallas and is giving some attention to plans for a toll road to connect Houston and the Beaumont-Port Arthur region.

A group of contractors headed by Farnsworth and Chambers Co., Inc., Houston, were low bidders for construction of two sections of the Fort Worth-Dallas toll road. They bid $13.7 million for Section 3 and $10.7 for Section 6.

A group headed by H. B. Zachry Construction Division, San Antonio, submitted the low bids for the other five sections of the road. Total for the five sections was $56.7 million.

The two private companies have much more ambitious plans. The charter of the Texas Turnpike Co. authorizes it to build from the Oklahoma border near Gainsville to some point between Fort Worth and Dallas, thence south to Houston and southwest to Corpus Christi. Its present plans are for a highway from a point about midway between Dallas and Fort Worth south past Corsicana and Madisonville to Houston, a distance of 223 mi. Cost of this work is estimated at $140 million.

The Texas Turnpike Co. received 10 bids for construction of the seven sections of its Dallas-Houston turnpike. Low was a joint bid of $85 million by H. B. Zachry, Brown & Root, Inc., Houston and Morrison-Knudsen Co., Boise, Ida. Contracts are expected to be signed and construction started this week.



The Sam Houston Turnpike Corp. has a charter to build from Dallas south to Waco and on to San Antonio about 265 mi. This work also is estimated to cost $140 million. At present, however, the corporation plans to build only from Dallas to Waco, a distance of about 90 mi, this work is estimated to cost $46 million. The corporation states that bankers have agreed to underwrite that amount of bonds.

First work on the Dallas-San Antonio turnpike will be done by Tecon Corp., Dallas. As a gesture, Tecon signed a contract to grade a one-half mile section for $1, and groundbreaking took place near Waco this week.

South from the Dallas-Fort Worth area the authorized routes for these two private projects lie close together. That situation led to a proposal that the two organizations combine forces and build a single highway south from the projected publicly owned toll highway linking Fort Worth and Dallas for part of the distance to Corsicana or Waco. However, those plans collapsed recently, and each project now plans to go ahead independently. Traffic studies, being made, had to take this duplication into consideration.

Preliminary design and cost studies for the project of the Texas Turnpike Co. were made by Deleuw, Cather & Co., Chicago. Traffic and earnings studies were made by Parsons, Brinckerhoff, Hall & Macdonald, New York.

Engineering studies for the Sam Houston Turnpike Corp. were made by the Capitol Engineering Corp., Dillsburg, Pa., and traffic and earnings reports, by Wilbur Smith and Associates, New Haven, Conn.

City Bans Building

Los Angeles forbids new construction until sewage facilities can be provided

A shutdown on new construction—particularly housing—in Los Angeles last week precipitated moves to correct what local officials and engineers were agreed is an acute sewage disposal problem.

Mayor Norris Poulson, alarmed at the rapid increase of construction without adequate means of sewage disposal, instructed the City Planning Commission to withhold approval of all new subdivision or tract developments until April 5. Then voters will be asked to approve a $60-million bond issue to enlarge collection systems and the capacity of the city's huge Hyperion plant (ENR Feb. 10, p. 30).

Poulson's action brought three quick results:

- A bond-support committee said that, should the bond issue fail, the city would be forced to level a sewer service charge averaging $30 per year per residence.
- A group of three engineering firms got ready to begin design of $41 million of new works.

The $60-million cost of new facilities is based in part on a report of a special citizen's committee appointed almost exactly a year ago to study the sewage situation (ENR Dec. 9, 1954, p. 24).

The ban on construction will be administered by a high-level committee of city department representatives. It was made clear last week that until the critical sewerage situation is eased—and that might take three years—new construction will be permitted under the following conditions only:

- If adequate sewerage is available for the area in question.
- If the new construction can be served by cesspools or septic tanks.
- If construction is undertaken with the understanding that it is being done at the owner's risk—and that occupancy will not be permitted until sewerage is available.

All of the restrictions will apply to industrial and commercial construction, as well as to new residential developments, city officials said.

Meanwhile, Hyperion Engineers, a newly formed joint venture of Holmes and Narver, Inc., Daniel, Mann, Johnson & Mendenhall and Koebig & Koebig are preparing to start detailed designs.

Hyperion Engineers will design work estimated at $41 million. City engineers will design some $20 million of new interceptors, relief sewers and system replacements.

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Architects for the project are Hopkins, Baker & Gill, Florence, S.C.; Consulting Engineers, Watson & Hart, Greensboro, N.C.; Heating and Plumbing Contractors, W. H. Singleton Co., Arlington, Va., and W. H. Sullivan Co., Greensboro, N.C.; General Contractors, M. B. Kahn Construction Co., Columbia, S.C.

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CITY BY CITY

Built-in Bomb Shelter

Milwaukee, Wis.—A new $4.5-million downtown office building will be constructed atop a huge underground atomic bomb shelter capable of housing 5,000 persons.

The shelter, extending 32 ft below ground, will be built with 9-ft-thick concrete walls on all sides. A 2-ft-thick steel ceiling will be separated from the concrete by two feet of air space.

So it can continue to operate if cut off from all city services in the event of an air raid, the shelter will be stocked with food and equipped with its own air conditioning system, water supply and electricity.

The building itself, scheduled for a $500,000 corner site with 150 and 100-ft frontage, will have eight floors of office space.

An adjacent section will contain 11 floors of parking space with automatic equipment capable of handling some 296 automobiles.

High Price of Pollution

West Wildwood, N. J.—This small borough of less than 300 people is learning the high cost of water pollution. In the state's toughest action against a community since it jailed a municipal administration 30 years ago, a Superior Court judge has imposed a $5,000 fine and ordered the borough to pay $25 a day until it complies with judicial order to cease polluting waters of Post Creek.

In addition, the judge fined the mayor and two councilmen $500 each for contempt of court. The mayor and one councilman had voted against an ordinance to appropriate $65,000 for connecting West Wildwood's sewers with Wildwood's nearby sewage works. The second councilman fined had abstained from voting on the question.

A two-thirds vote of the seven-member council had been needed to pass the necessary legislation for a bond issue to finance clean-up of the water pollution problem. Those on the council who voted for the ordinance got off without fines.

Improvement Aftermath

Detroit—Nearby neighbors of Detroit's new $88-million civic center (ENR Feb. 3, 1955, p. 22) will have to pay for the privilege of looking out on the waterfront development. Already, property assessment increases running as high as four times the

1954 rate are being applied to land bordering the center.

The largest boost is on property on First Ave. between Fort and Congress Streets. There, the $75-front-foot rate in effect last year has been raised to $300 a front foot. The north side of Jefferson Ave. between Woodward Ave. and Griswold now is being assessed at $1,000 per front foot, as against $350 last year.

Another factor influencing the boost of property values is the John C. Lodge Expressway, which will extend into the civic center when it is completed.

Old Age Benefit

San Francisco—San Francisco's percentage of elderly people is growing—10% of the population is over 65 and 11% is 55-65 years of age. With this in mind, the San Francisco Housing Authority plans to build a $2.5-million housing and recreation center primarily for its older citizens.

If approved by the national Public Housing Administration, the center will go up on a site bordering the authority's Francisco Plaza public housing project, now under construction (ENR Feb. 18, 1954, p. 173).

The housing authority wants to provide 216 apartments in two main T-shaped buildings flanked by parking space and outdoor recreation areas. The buildings would have special features for partly disabled persons: ramps instead of stairs, oversize hallways and elevators, and sunrooms. The entire ground floors of both buildings would be left open to various city agencies for development of social, recreational and health activities.

The project would be designed for families, but would admit types of families not eligible for other public housing. This would include such combinations as mother and son, brother and sister. To prevent the project from becoming "institutionalized," at least 40 apartments would be two-bedroom ones to attract families with young children.

$25-Million Expansion

Columbus, Ohio—Ohio Department of Agriculture officials have mapped out a 12-year master plan for expansion of the Ohio State Fairgrounds, construction of some 20 new buildings and general ground improvements are estimated to cost $25 million.

The over-all proposal includes con-

(*Continued on page 32*)

Sonotube®

FIBRE FORMS

for round columns of concrete

Dallas, Texas Parking Garage, Jacob E. Anderson, Architect. John A. Murlin, Structural Engr., James Stewart Co., Contractors.

SONOTUBES are easily sawed to required length.

Save time on formwork!

. . . low cost SONOTUBES make it possible

Construction time for this Dallas Parking Garage required only 27 days. And one of the major factors contributing to the savings in time and money was the use of low cost SONOTUBE Fibre Forms.

SONOTUBES were dropped over vertical and spiraled reinforcing rods to provide the formwork for the round concrete columns. Holes to receive the fibre forms were precut in the beam formwork.

SONOTUBE Fibre Forms handle easily because they are lightweight . . . take less time to erect because they require minimum bracing. Approved by architects and engineers everywhere, widely used by contractors.

SONOTUBES are available in 31 sizes from 1" to 36" I.D. up to 50' long. Can be supplied in specified lengths or sawed to your requirements on the job.

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WATER Paces Lakeland's Business Growth!

Allis-Chalmers Helps World's

THE "WORLD'S CITRUS CENTER" is being helped by Allis-Chalmers in the race to keep water works ahead of population growth. In ten years, Lakeland's population has increased 70 percent, meters have doubled, and gallonage pumped has nearly tripled!

Lakeland is so named because of the 12 lakes within its city limits. It is near the geographical center of Florida, in Polk county . . . producer of a third of all Florida citrus, two thirds of U. S. phosphate, and more cattle than any other county in the state.

Lakeland gets its water — 154,363,500 gallons per month average in 1952 — from 11 deep wells running down to 1201 ft in depth. Storage capacity is 1,778,000 gallons. Following aeration, Allis-Chalmers pumps . . . driven by Allis-Chalmers motors . . . using Allis-Chalmers generated power . . . force the water into the city mains.

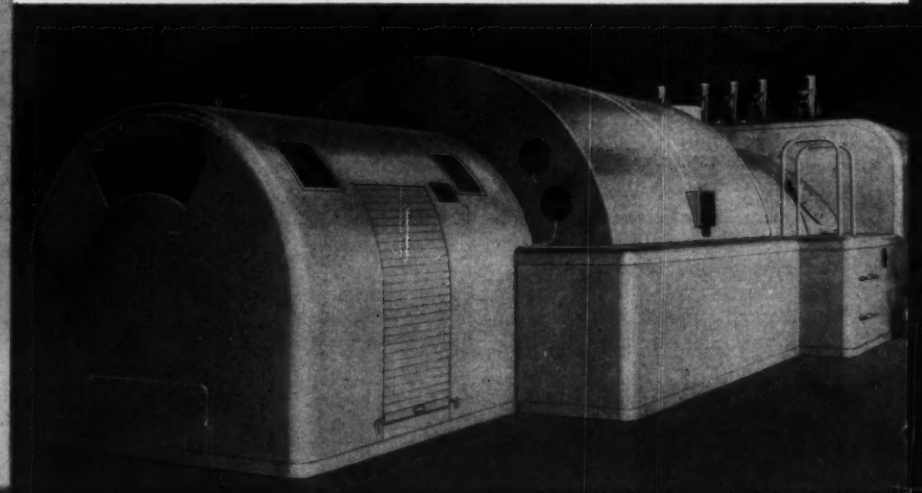
Lakeland has learned by experience the wisdom of depending on Allis-Chalmers for a complete range of public works equipment. Some of their A-C equipment has been in operation for over 30 years and maintenance has been "practically nil." A-C equipment at Lakeland ranges from three turbine-generators through transformers, M-G sets, and controls to motors and pumps of many sizes.

When *your city* plans expansion or modernization, do as Lakeland and other leading cities are doing — take advantage of Allis-Chalmers experience as builder of the world's widest range of public works equipment. Literature on all products available; Public Works Bulletin 25C6607A and Pump Bulletin 08B6146B just off the presses. For your copies, just call your nearest A-C sales office or write to Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4070

POWER TRANSFORMERS were furnished by Allis-Chalmers. Those above are 833 kva, single phase, self-cooled units in Lakeland suburban substation. Other electrical equipment supplied includes controllers for the 150 hp deep well pump motors.

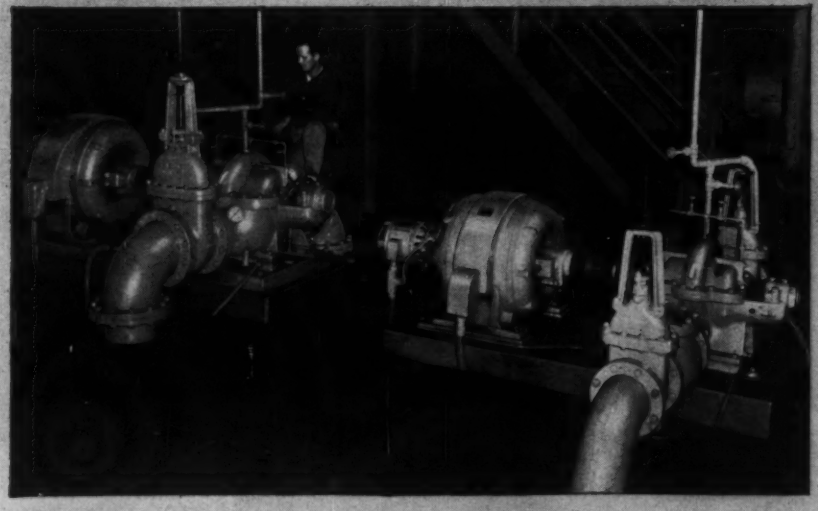
NEW POWER HOUSE features Allis-Chalmers 20,000 kw steam turbine generator unit. In addition to the steam turbine, hydrogen cooled generator, main and pilot exciters, and hydrogen control equipment, A-C also furnished the three 6 x 4 in., 450 gpm, 1150 psi boiler feed pumps.

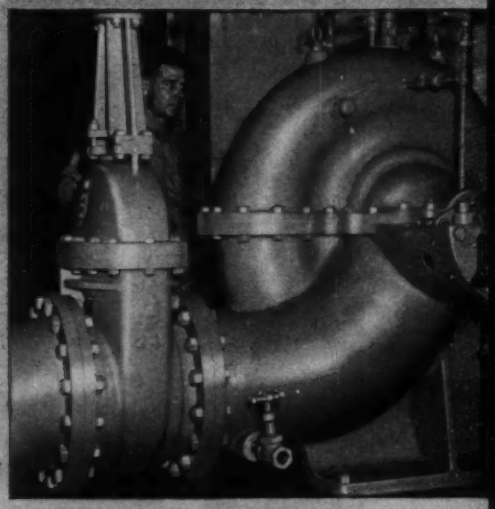


Citrus Center Expand Water Works

LAKELAND FROM THE AIR, looking east. Over 600,000 people live in a 50 mile radius from Lakeland, Fla. Old power house, containing two Allis-Chalmers 5000 kw steam turbine generator units and associated equipment, is on left shore of Lake Mirror in center of above photograph.

CITY MAINS ARE SUPPLIED by Allis-Chalmers pump-motor teams ranging in capacity from 2000 to 4000 gpm each. Typical setup shown below: at left is a 12 x 10 in. pump rated 4000 gpm at 160 ft head, driven at 1800 rpm by 200 hp motor. At right is a 2000 gpm, 8 x 8 in. pump driven by a 100 hp, 1800 rpm synchronous motor.





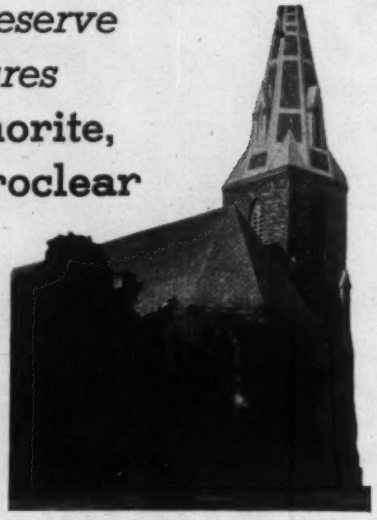
PUMPS RANGE IN SIZE from 1¼ x 1¼ in. to this 16 in., 6000 gpm, 16 ft head unit furnishing condenser cooling water in old power house. Here Allis-Chalmers supplied two 5000 kw steam turbine generator units, boiler feed and condenser circulating water pumps, and crane motor-generator set.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

Builders of the World's Widest Range of Public Works Equipment

How to restore and preserve costly masonry structures with **D-J Mortar, Thorite, Thoroseal and Thoroclear** *even though masonry looks beyond repair!*



Second Episcopal Church of Boston, Brookline, Mass.

Only the bare skeleton of cornice remains after years of disintegration.

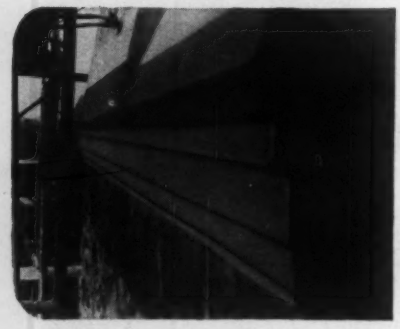
To repair, all loose material was cut out and complete surface was wire brushed in preparation of THORITE treatment.

Above photos show how vines grew over stone structure and hid most of damaged masonry.

Vines were cut away from building and disintegrated joints grouted with D-J Grouting Mortar.

Stone trim was then given two coats of THOROSEAL. Entire surface received a coat of transparent THOROCLEAR.

ALL MASONRY NEEDS PROTECTION



AFTER Brush and trowel coat of THORITE, nonshrink patching mortar was used to restore this masonry to its original lines. A two-coat application of THOROSEAL was applied to beautify and protect the surface. Nonsagging THORITE can be used to model any masonry structure back to its original lines.

Stretcher stone work treated with D-J Grouting Mortar and entire stone surface THOROCLEARED.

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Standard Dry Wall Products, Inc.

NEW EAGLE, PENNSYLVANIA, U.S.A.

struction of a new museum, a state department building, an agricultural administration building, a manufacturers building, a health-safety building—plus structures to house youth exhibits, consumer goods, arts and crafts, livestock and poultry.

A new auditorium with a 6,000-10,000 capacity will be built to handle year-round events. And the present track and grandstand will be eliminated and new facilities erected.

Seventeenth Ave., which runs through the land is slated to become a main crosstown artery and will be lowered to provide unbroken grounds for the exposition.

A 150-ft-wide mall will run from the main (11th Ave.) entrance to the center of the newly acquired 230-acre tract north of 17th Ave. At its northern end will be a lagoon surrounded by a court of counties and the manufacturers building containing semi-permanent exhibits.

More than 330 acres will be included in the fairgrounds when plans are completed by the Columbus architectural firm of Sims, Cornelius and Schooley.

Long-Range Sewage Plan

Jacksonville, Fla.—An engineering report recommends a $146.1-million master sewage and drainage plan for Jacksonville and surrounding areas to be completed by the year 2,000.

Metcalf & Eddy, Boston, and Reynolds, Smith & Hills, Jacksonville, suggest an outlay of $24.8 million to meet immediate priority needs. But the engineers estimate that almost double that amount—some $46 million—is required for those parts of the overall plan that they recommend for early financing.

The plan would provide the following features: (1) A system of main and sub-main sewers with pumping stations and connections to existing sewers; (2) lateral sewers in areas not now provided with sewers; (3) appropriate sewage treatment work; (4) an outfall into the St. John's River.

It was suggested that funds for construction, operation and maintenance of the development could be derived by either setting up a single metropolitan sanitary district, by extending the city limits, or by establishing a number of sanitary districts to provide for various suburban areas.

Jacksonville's City Commissioner has referred the report to a citizens' advisory committee. The committee will recommend steps to be taken to bring the plan to a bond issue referendum before June.

WORKSHOP AREA — O. E. McINTYRE, INC., DIRECT MAIL PLANT, WESTBURY, L. I., N. Y.

New ceiling does 3 big jobs at 1 low price†

1. Makes a permanent, dimensionally stable, fire-safe form board.

2. Reduces noise up to 75%.

3. Provides highly efficient roof insulation.

For the price of the form board alone, Fiberglas*-Acoustical Form Board performs all these functions! That's why it is so popular for low-budget projects with poured gypsum or light aggregate roofs, like the new O. E. McIntyre, Inc., building shown above.

If you're designing or building a school, factory, shopping center, recreation center or any similar project, you should know all about this 3-in-1 Fiberglas development.

For complete technical data, see our catalog in Sweet's File or write: Owens-Corning Fiberglas Corporation, Dept. 145B-24, Toledo 1, Ohio.

†Approximately 50¢ per sq. ft., based on an area of approximately 25,000 sq. ft.

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Engineer-Contractor: Brown and Matthews

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**T.M. Reg. Owens-Corning Fiberglas Corp.*

HIGH ABOVE Gaillard Cut, contractor carves Contractors Hill. Truck and shovel in foreground are at location of notorious fissure. Mound behind truck is example of "flywall," which is blasted last—and carefully—to prevent slides into canal.

Ticklish blasting problem . . .

Taking the Menace out of Contractors Hill

Col. Hugh M. Arnold
Engineering and Construction Director
Panama Canal Company
Balboa Heights, C. Z.

A year ago world attention focused on the "discovery" of a crack in Contractors Hill. According to reports the crack threatened "to close the Panama Canal for a year" unless something was done to correct the general condition.

Since that time, ships have continued to pass uninterrupted through the canal, and the rumors of the canal closing have died down. But the Panama Canal officials, engineers and construction contractors have lost no time in determining what is needed to prevent such a disaster, and have pushed the needed work at Gaillard Cut.

The project under way has turned out to be one of the most challenging excavation jobs since the construction of the canal itself.

Contractors Hill is a huge block of highly fractured and jointed rock "floating" in a formation of treacherous cucaracha shale. The hill, a free block, is criss-crossed and cubed by vertical joints running 15 deg and 75 deg off the line of the canal, and by bedding planes dipping about 30 deg to 50 deg toward the canal.

Apparently the construction of the canal, which required the excavation of 200 ft of soft rock in front of Contractors Hill, caused the opening of a series of the weaker joints. Raising and lowering of the water table, moderately heavy seismic disturbances, and perhaps other factors gradually widened the fissure to a point where, in 1938, it was wide enough to be noticed by a survey man. From that time on, periodic measurements were taken on the crack. A year ago, it was noticed that the fissure, which was now a foot or more wide and 1000 ft long, and could be sounded to a depth of 600 ft, was opening at an increased rate.

Even if the free block could be stabilized by relieving hydrostatic pressure in the main fissure, the steep and overhanging slope on the canal face of the hill, coupled with the highly weathered condition along the sloping bedding planes, created an intolerable threat at the canal's narrowest point.

In May 1954, Brig. Gen. John S. Seybold, governor of the Canal Zone, and president of the Panama Canal Co., convened in the Canal Zone a board of consulting engineers consisting of Arthur Casagrande, soils mechanics specialist from Harvard University; Clifton W. Livingston, exposive specialist from the Colorado School of Mines; Hibbert M. Hill, chief engineer for Northern States Power Co.; and Edwin E. Abbott, civil engineer for the Army Engineers.

• **Tunnel cut proposed** – This board recommended construction of a 5 × 7-ft tunnel from just above the water on the canal side to intercept and drain the main crack. This would eliminate the hydrostatic pressure causing the free block to move. The board further recommended that about one-half of the weight of the free block on the canal side of the fissure be removed, but that only as much be removed behind the fissure as would be required to allow access to the work area and at the same time to maintain a stable back slope for the final section.

Last May Tecon Corp. of Dallas, Texas, was engaged to excavate about 4.5 million tons of rock from the face of the hill as soon as practicable. The work was to be done without increasing the danger of a major rock slide or interfering with the passage of ships through the canal, which is located 330 ft below.

It took Tecon six weeks to assemble personnel and equipment for transport to the Canal Zone. A local subcontractor, Bildon, Inc., started on

the drainage tunel, finishing it in mid-August.

Meanwhile, in late July, the Tecon Corp. moved the following pieces of heavy equipment three miles from ship to site:

Three rotary-type drills, truck mounted

Two crawler tractors with two power booms and drifters mounted forward on each

Three 2½-yd power shovels

Thirteen 22-ton end-dump trucks

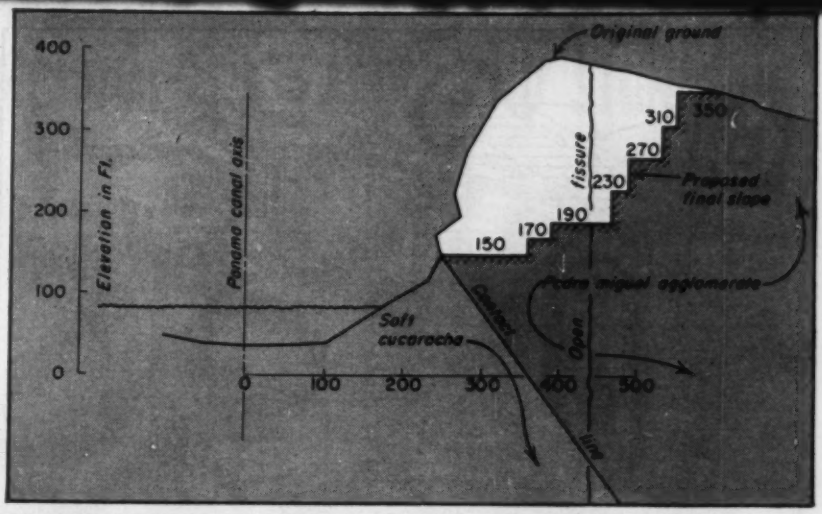
Four large crawler tractors

These items have kept the job ahead of schedule.

In a series of conferences between the contractor, Panama Canal Company, and consultants, a general method of drilling, blasting and excavation was established. Care was taken not to set the criteria too rigid, leaving field men to work out detailed shooting plans and methods of removal, based upon job experience as they went along.

The approach was to remove the crests of the hill (of which there were two) in layers from El 417 down to El 390 on the north, and from El 385 to El 370 on the south end. Then, from the approximate center and both ends of the hill excavate parallel to the canal on a series of benches 40 ft in height and alternating 20 ft and 40 ft wide, down to El 150. At this elevation, leave a wide berm out to the original face adjacent to the canal.

Haul roads would be constructed through the center and around both ends of the hill, hauling a portion of the excavated spoil down the back side of the hill and the remainder to an abandoned reservoir (used during construction of the canal) a mile away from the project.



MASSIVE STEPS, flat on canal side of fissure, steep on the other, will replace steep and overhanging hard-rock cliff, which "floats" in soft shale.

• **Engineered blasting**—Special restrictions imposed by the sensitive location of the excavation require carefully-detailed planning of the drilling and shooting program. Each proposed shot is reviewed and approved on paper before drilling is started. Drill patterns are staked out on the ground, the location, depth and diameter of every hole being specified. After drilling, holes are tagged to show the amount and types of dynamite to be loaded, the type of detonator to be used and the position of detonator in the hole.

The type of drill pattern to be laid out is dictated by the physical condition and characteristics of the rock in addition to the location of pattern in relation to edge of the canal and main fissure.

Although there are two classes of rock—Pedro Miguel agglomerate and cucaracha shale—the agglomerate varies from very hard to soft without any specific pattern and the shale varies from soft rock to clay in beds. There are occasional instrusions of dense, hard basalt along the contact zone between the agglomerate and shale.

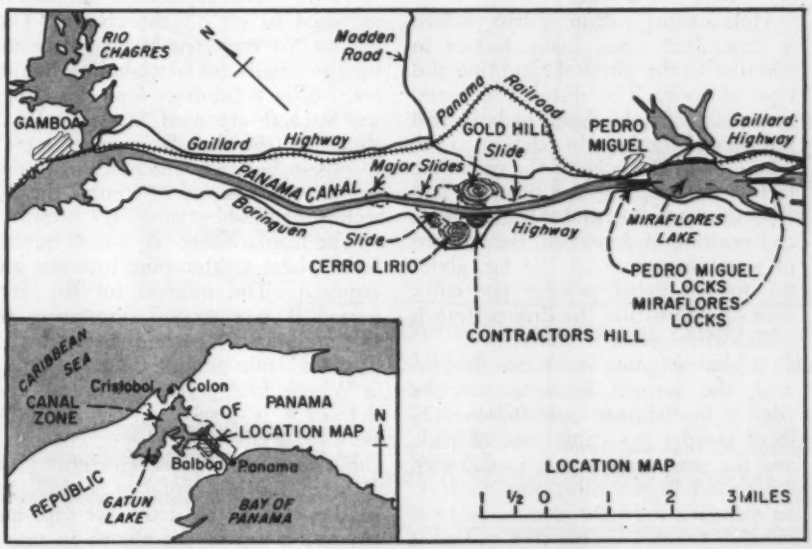
Two major physical factors govern the layout of drill patterns: the highly weathered, steep and overhanging slope along the canal side of the hill and the main open fissure, which zigzags through the excavation area from north to south. In laying out the drill

Slides have closed Panama Canal seven times since it was completed

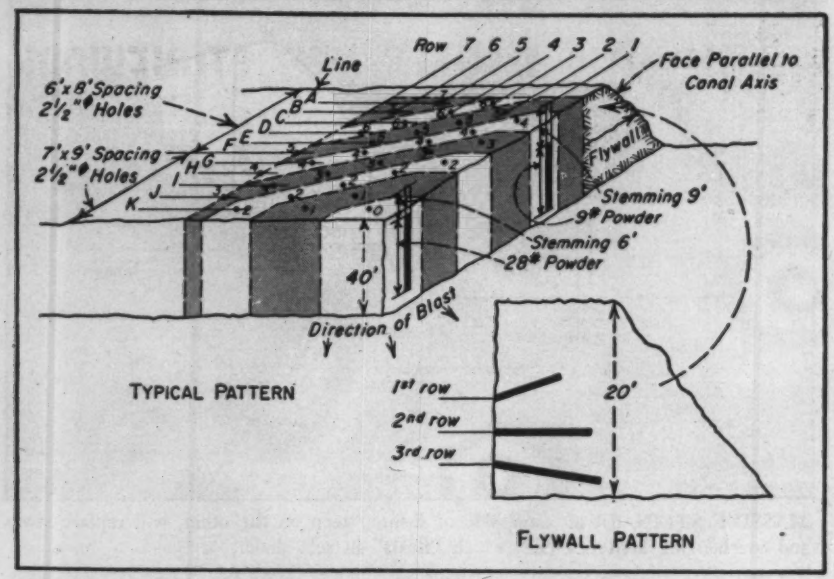
From the time of the first slides in 1905, there has always been land on the move in the Panama Canal.

The ten mile section, known as Gaillard Cut (formerly Culebra Cut) from the Chagres River at Gamboa to the Pedro Miguel Locks, where the canal crosses the continental divide, is the section where disastrous slides occurred during and after the construction of the canal. These slides, which delayed the opening of the canal two years and closed it to traffic on seven occasions since, have required the excavation and removal of 75 million cubic yards of earth and rock not included in the original canal excavation.

Right in the center of all major slides stand what were always assumed to be two "Rocks of Gibraltar": Contractors Hill, formerly El 417 ft, on the west bank; and Gold Hill, El 650 ft, on the east bank. The stability of these two hills had never been questioned. Investigations of Gold Hill disclose no danger.



"ROCKS OF GIBRALTAR" in slide zone were Contractors Hill and Gold Hill. Now the former has lost the distinction—and is losing 4,500,000 tons of rock.



BLAST PATTERNS are carefully engineered to avoid triggering feared catastrophe. Flywall gets light charges so it won't topple into canal.

patterns on the canal side of the fissure, the row of holes adjacent to the fissure is placed closer to the fissure than to the next row. On the landward side of the fissure the distance from the fissure to the first row of holes is greater than the distance to the next row of holes.

These regular drill patterns are not used in a 20-ft-wide band along the canal side of the hill. This, called the "flywall", is the last to be removed at each level, being excavated with special care.

A typical drill pattern for the bulk of excavation is illustrated. Alternate-shaded volumes show the progression of blast delays radiating inward from the intial detonation. Hole spacing is least on the canal side of the blast, just inside the flywall.

Hole-loading within a drill pattern is dependent upon many factors in addition to the physical condition and type of rock. The distance between holes, size of hole, depth of hole, and position of the hole in relation to the fissure or to the edge of the canal, are factors determining the quantity and type of dynamite to be loaded, type and position of detonator, the amount of stemming required. So far, about 0.5 to 0.6 lb of powder per cubic yard of rock within the drill pattern is sufficient for good fragmentation.

When shooting next to the flywall, the row of holes nearest the edge is loaded with only 0.2 to 0.25 lb of powder per cubic yard of rock, and the next two rows are loaded with 0.3 to 0.4 lb per cubic yard of rock. In this area the light charges make it possible to crack up the rock so that it can be snaked out with tractor and cable, while the flywall stays in place.

Except for a few shaped charges used to break up over-sized boulders, all explosives are 40%, 58% or 60% dynamite. With vertical holes drilled in patterns, the dynamite must be of sufficient strength and quantity to shear the rock at the bottom of the holes to give a level quarry floor and to break up the rock between holes without throwing rock up in the air. The bottom 15% to 20% of dynamite to be loaded in the hole is 60% strength, to shear the rock between holes. The balance of the load consists of either 40% or 58% strength dynamite, depending upon condition of rock and nearness to canal. Due to excessive rainfall in this area, a dynamite with good water resistance characteristics is used.

Three types of electric detonators are used to set off the charge. The regular No. 6 electric blasting caps are used primarily for block-holing boulders. Milli-second delay caps—with .025 sec interval—are used in wall-pattern shooting (the flywall is an example) to obtain better fragmentation, to decrease vibration and to control the direction of the blast and back pressure.

The regular delay cap is used in patterns where greater time intervals are required. The interval for the first period is one second, increasing to two and one-half seconds between the 9th and 10th periods.

When firing vertical holes, the detonator is placed on or near the bottom of the hole in order to cause the base of the face to "kick out" first. When firing horizontal or angle holes in the flywall, the detonator caps are placed on top of the charge in order to "kick out" the face before the bottom of the hole fires.

To control the shots, the correct-diameter hole is drilled to the desired depth, properly spaced within the drill pattern, loaded with the proper dynamite, and finally fired in the desired sequence.

The diameter of the hole must be of such size that sufficient dynamite to break up the rock between holes may be loaded therein, leaving room for the desired amount of stemming. Too little stemming would throw up and endanger personnel, equipment, and the canal itself. Too much stemming, on the other hand, would not break top rock to a size which can be handled with the shovels.

Experience has shown that depth of stemming should be somewhat less than the distance between rows of holes.

• **Shooting the flywall**—The flywall is drilled and shot in lifts about one-half the height of those in the regular drill patterns. Horizontal holes of varying depths depending on the thickness of flywall are drilled within its face in one, two or three rows, depending on its height. The spacing of holes within rows varies from five to seven feet with the distance between rows about five feet at the face. The holes are loaded with about 0.2 lb of powder per cubic yard of rock, using a relatively slow-burning dynamite, the top row firing first and the middle row firing after the bottom row. With the depth of holes being less than the thickness of the flywall, and explosion starting at its face, a cavity is shot out of the bottom allowing the top rock to fall in where it can be excavated. This method has proven efficient in keeping to a minimum the material going into the canal, although removal is difficult and slow, due to poor fragmentation resulting from the low powder factor. Special care is used in dragging and snaking the boulders off the edge of the cliff.

In spite of all this special care, several large blocks of the overhanging slope have separated along old weathered seams and slid into the canal. The largest of these, estimated at 5000 cubic yards, required extensive underwater drilling and blasting before removal by a dipper dredge. However, there has been no interruption of the daily traffic through the canal.

As of January 1, 1955, the contractor has drilled nearly 47 miles of hole, shot 300,000 lb of dynamite and removed 660,000 cu yd of rock from the face of the hill.

Collaborating with the writer in the preparation of this article were Lt. Col. Edward B. Jennings, project engineer, and Leo W. Cagley, chief, civil engineering branch, Panama Canal Company.

NATIONAL MARINE MONUMENT'S MARBLE AND STONEWORK

fastened with *DRIVE-IT*

Steel clips to hold marble slabs fastened with heavy-duty DRIVE-IT.

DRIVE-IT 410 used to anchor huge marine corps monument in Washington, D. C.

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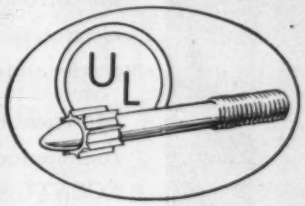
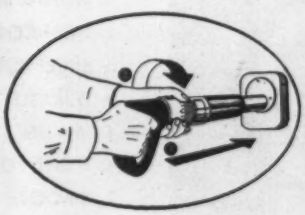


Drive pins are Underwriters Laboratories approved.

Controlled Power. First and only tool which requires but one standard power load regardless of penetration desired. No need to buy and stock various strength power loads.



Three-way Safety. Cannot be discharged accidentally, due to the push and turn firing sequence. This, plus the large, swivel safety pad, makes DRIVE-IT triple safe.

More fastenings per hour with this speedy way of loading and ejecting cartridges.

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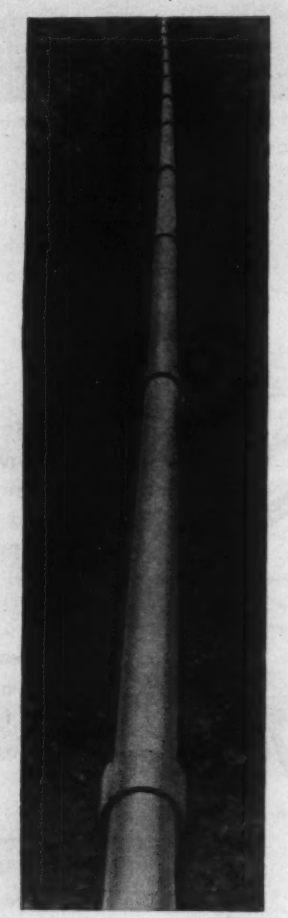
"CENTURY"® PIPE



is made of asbestos fiber and portland cement—two practically indestructible materials. Its extreme durability means extra long life. Highly resistant to soil corrosion, immune to tuberculation and electrolysis, it assures maintenance-free service and consistently lower pumping costs.

More and more cost and tax-conscious communities are turning to "CENTURY" Pipe. We will gladly furnish information about its advantages. Write today for booklet "Mains Without Maintenance."

QUALITIES THAT MAKE "CENTURY" PIPE ECONOMICAL, TROUBLE-FREE, LONG-LIVED

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2. NON-CORROSIVE
3. EXCEPTIONALLY STRONG
4. DURABLE
5. IMMUNE TO ELECTROLYSIS
6. TIGHT JOINTS
7. SMOOTH BORE
8. EASILY, QUICKLY LAID
9. LIGHT WEIGHT
10. LOW COST

"Century" Pipe meets the A.W.W.A., A.S.T.M. and Federal Specifications for asbestos-cement pressure pipe.

KEASBEY & MATTISON COMPANY • AMBLER • PENNSYLVANIA

K&M best in asbestos ®

Nature made asbestos . . . Keasbey & Mattison has made it serve mankind since 1873

UNIMPEDED by bridge railings or sharp curves, realigned 9.6-mi stretch of highway speeds traffic that used to hug hill in background.

Bridges Go as Engineers Realign Highway

Oscar Ostenson
Division Construction Engineer
Montana Highway Department

High fills over corrugated culverts provided the economical answer to a modernization problem when Montana realigned U. S. 10 east of Miles City.

In the realm of high fills over culverts the Montana installations (60 ft) hardly compare with the earlier projects on U.S. 31 near Cullman, Alabama (137 ft); nor the near-record 165 ft on U.S. 70 near Asheville, North Carolina. Of more importance here were the elimination of inadequate bridges and shortening of the original 11.3-mi section of highway to 9.6 mi. Where there had been 47 curves, with all their hazards, now there are only five, with a maximum curvature of 1½ deg.

The country through which this highway passes is alternately rolling and rugged, with sparse vegetation. Total grading involved 1,300,000 cu yd of fill and cut with fills ranging up to 70 ft. At one location, 290,000 cu yd of unclassified excavation was moved within an 8,000-ft section.

• **The replacements**—Six bridges were replaced with corrugated drainage structures, one of which consisted of twin multi-plate pipe-arches 189 in. by 115 in., 90 ft long under 7-ft cover. The pipe-arches replaced a 76-ft timber bridge.

Another bridge, 114 ft long, also of timber construction, gave way to a 120 in. multi-plate pipe, 5% ellipse, and 170 ft long under 37 ft. of cover.

Longest of the timber bridges replaced by structural plate pipe was 152 ft. Here the 5-gage pipe was 180 in. dia, 5% ellipse, 152 ft long under 32 ft of cover.

Two of the timber bridges were replaced with twin 180-in. multi-plate pipes, 5% ellipse, each 144 ft long on a skew under 9-ft cover; and a single 150 in. multi-plate pipe 226 ft long, 5% ellipse under 57-ft cover.

In addition to the bridge replacements, there were two other conventional structural plate pipe installations—one a 78 in. multi-plate pipe 232 ft long, 5% ellipse, under 60-ft cover; the other twin 120 in. pipes under 7-ft cover.

Corrugated metal pipe 24-in siphons and 90-in multi-plate cattle passes completed this part of the work.

All structures were carefully designed, using the Talbot formula and allowing for 2 in. per hour runoff. Rainfall is infrequent in this region, but when it occurs it is extremely heavy with a high percentage of runoff. And because erosion is always a serious problem, it is better to have fills than bridges.

• **Flexible surface**—Surfacing and paving included 11 to 7 in. of select surfacing material, a 3-in. cushion course of ¾-in. crushed stone, a 2-in. plant mix oil mat, and a seal coat of 100-120 penetration plant mix asphalt.

Traffic is well protected at roadside by 12,150 ft of metal guardrail installed on 8 in. timber posts. Visiting engineers who have seen it have remarked that it is a beautiful job of horizontal and vertical alignment.

Cost of grading and drainage was $465,920—$20,000 under the bid items. Surfacing and paving added $229,096, making a total cost of the project $695,916.

This experience emphasizes the failure of older bridges to do their job measured by today's highway demands. Built, 10, 15, 20 or more years ago to a specified load capacity, they are no longer able to cope with traffic conditions. In contrast, a fill, high or low, properly drained, not only will take any conceivably practical load, but will insure smooth, uninterrupted flow of traffic with none of the hazards, mental or physical, that the best-constructed bridges present. This is not to say that bridges are unnecessary or ever will be; only that under certain conditions, such as this highway, "earthen" bridges were the natural and logical choice.

Scott P. Hart was State Highway Engineer and S. B. Sanders, construction engineer, Montana Highway Department. The author supervised construction of the project, while Joseph M. Liffrig was the project engineer. Grading and drainage contractor was Holzworth Construction Co., Miles City, Montana, and the Lou Richardson Co. of the same city was paving contractor. Corrugated metal drainage structures supplied by Northwest Division, Armco Drainage & Metal Products, Inc.

1. Abraham Lincoln Houses

Six Good Reasons Why Pittsburgh

Were Used In These Recent

2. 100 Park Avenue

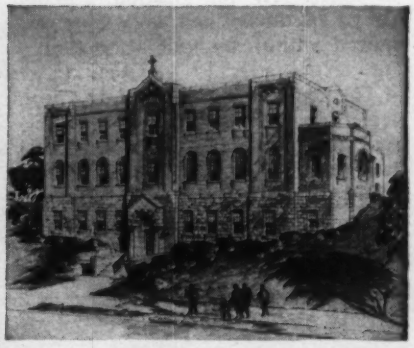
First, Steeltex, the combination welded steel mesh with its own built-in pliable form attached, requires no additional forms or reinforcement for giving shape and strength to concrete floors and roofs (see note below right).

Second, Steeltex can be installed much faster than other types of forms and reinforcement for concrete floors.

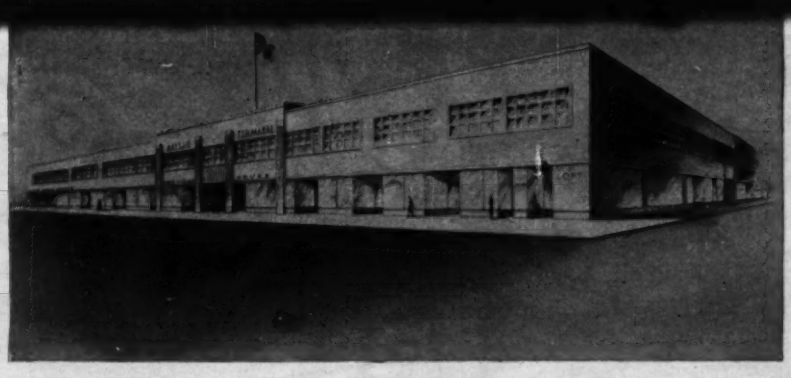
Third, Steeltex saves concrete.

Fourth, Steeltex minimizes leakage,

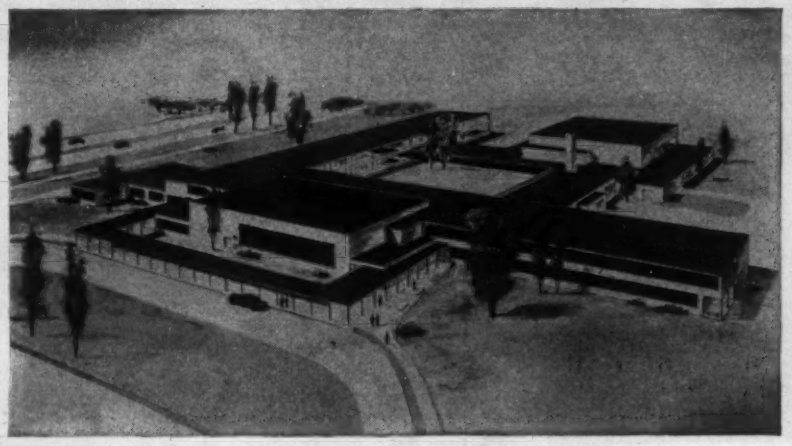
3. Franklin Simon Store



4. Immaculate Conception Convent



5. Nassau Terminal Building



6. Wantagh High School

Steeltex® And Welded Wire Fabric Buildings In New York City

saves clean-up expense.

Fifth, Steeltex assures a strong floor.

Sixth, Steeltex costs less than other reinforcing materials and systems.

On these two pages are pictured $34.2-million worth of recent buildings in New York City and suburbs in which Steeltex or Pittsburgh welded wire fabric or both were used to reinforce concrete slabs.

For details . . . **read story at right.**

1. Abraham Lincoln Houses, New York City. *Architect:* Skidmore, Owings and Merrill—Tandy and Forbes; *Structural Consultant:* William Hoffberg; *Contractor:* H. R. H. Construction Corp. This is one of 75 housing projects built by the New York City Housing Authority, whose reputation for sound and economical construction has attracted nationwide attention. It was built at a cost of $14.2 million and consists of 14 buildings housing 1,286 families (total population over 5,000—larger than many towns). In all buildings Steeltex or Pittsburgh welded wire fabric was used for floor reinforcing.

2. 100 Park Avenue, New York City. *Architect:* Kahn & Jacobs, New York, N. Y.; *Consulting Engineer:* Jaros, Baum, and Bolles, New York, N. Y.; *Contractor:* George A. Fuller Company, New York, N. Y. Built at a cost of $15 million, the building incorporates Pittsburgh Steel Products Company's welded wire fabric reinforcing throughout the floors.

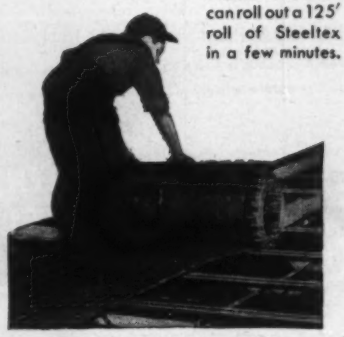
3. Franklin Simon Store, Garden City, Long Island. *Architect:* Herbert Beidler, Chicago, Ill.; *Contractor:* Andrew Weston, Inc., Woodmere, Long Island, N. Y. This is a typical example of the Franklin Simon chain of shopping stores incorporating Steeltex floor lath in floors and roof. Steeltex is used widely for construction of suburban stores of this type.

4. Convent of the Immaculate Conception, Jamaica Estates, Long Island. *Architect:* Charles M. Spindler, Brooklyn, N. Y.; *Contractor:* Caristo Construction Co., Brooklyn, N. Y. This $600,000 convent has just been completed. Its construction incorporates Steeltex floor lath over steel joists in floors and roof.

5. Nassau Terminal Building, Hempstead, New York. *Architect:* Harold Carlson, Garden City, N. Y.; *Contractor:* Marvin Construction Corp., New York City; *Contractor Supervision:* Fred T. Ley & Co., New York City. This bus terminal, containing 33 stores, over sixty thousand square feet of office space, twenty-four bowling alleys, and accommodating twenty-three buses at one time, was built at a cost of $1,500,000. Steeltex floor lath was used over steel joists in the floors and roof.

6. Wantagh High School, Wantagh, Long Island. *Architect:* Frederic P. Wiedersum, Valley Stream, N. Y.; *Contractor:* Jonwal Construction Company, Inc., Mineola, N. Y. This Long Island high school, built at a cost of $2.5 million, was completed last fall. Steeltex floor lath was used over steel joists in the floors and roof.

Send for your copy of "Pittsburgh Steeltex—Backbone Of Concrete, Plaster, Mortar."



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Steelwork for giant Ford plant bolted in 78 working days

The old adage, "now you see it, now you don't," worked in reverse recently at Ford's new assembly plant at Mahwah, N. J. For the steelwork for this huge structure, the largest Ford assembly plant ever constructed, was erected in only 78 working days.

The one-story mill-type structure is 2115 ft long and 790 ft wide, and ranges in height from 25 ft to 31 ft. Its total layout covers an area of 1,800,000 sq ft. Its steel framework, weighing 9600 tons, is bolted with nearly 250,000 Bethlehem bolts, including approximately 150,000 high-strength bolts.

Bethlehem High-Strength Bolts make possible a saving in erection time because they can be installed quickly by a two-man crew. The hexagonal-head bolts are inserted with two hardened washers, one under the head, the other under the hexagonal nut. Then the nut is tightened to predetermined torque with an air-powered impact wrench, so that it stays tight indefinitely.

Bethlehem High-Strength Bolts are furnished in carbon steel in all sizes from ½ in. to 1¼ in., and in varying lengths. They are heat-treated by quenching and tempering, and meet all the requirements of ASTM Specification A-325.

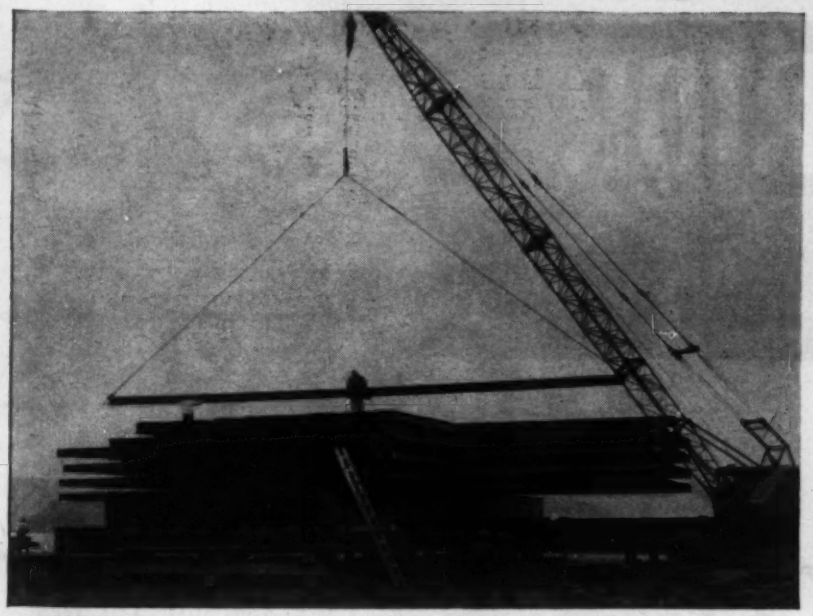
Whether or not you have immediate construction in mind, you'll want to look into the saving in erection time made possible by the use of Bethlehem High-Strength Bolts. The nearest Bethlehem office is at your service.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Bethlehem High-Strength Bolts

BETHLEHEM STEEL



ANOTHER STRAW—a steel beam—on the load used to test a 14-in. H-pile for the Richardson Bay Bridge, north of San Francisco. Total load is twice design load.

H-pile Resists 450-ton Load

A single 14-in., 193-lb, H-pile has successively resisted a 450-ton load test on a northern California bridge job. This is believed to be the heaviest load ever imposed on an H-pile and might be the biggest weight ever placed on a single pile.

The 450-ton load—double the 225-ton design capacity—was left in place for 60 hours. The 138-ft long pile had previously been driven to solid end bearing. Net settlement after removing the load was ¼ in.—just equal to the maximum permitted. Total settlement during the test was ¾ in, but part of this was due to elastic deformation of the steel member and was regained on removing the load.

The bridge itself is the half-mile long Richardson Bay Bridge on U.S. 101 in Marin County just five miles north of San Francisco (ENR July 29, 1954, p 26). Included in the supporting elements are 238 bearing piles each designed for 225 tons—by far the heaviest single-pile load ever permitted on a California highway department bridge structure.

Plans permitted the contractor to select any one of several pile designs. The pile load test was included as part of the regular work on the job, with a bid item for the test. The successful low bidder on the $3 million contract—The Duncanson-Harrelson Co. and Pacific Bridge Co.—selected the 14-in. H-pile. This was in preference to heavy concrete piles, prestressed concrete piles, and an 18-in. H-pile made of welded plates.

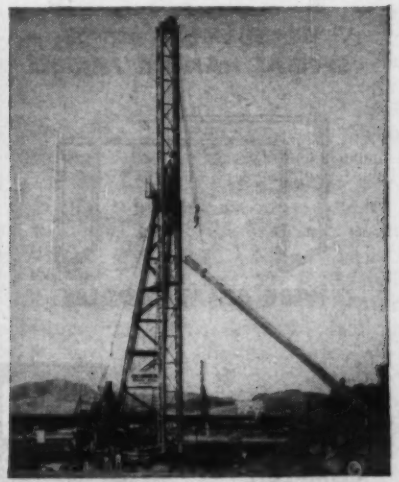
The load included a 104-ton grillage made of 36-in. steel members that will be used by the contractor as falsework on later parts of the work. Between the pile and the grillage was a short heavy needle beam specially fabricated for the job. Loaded on the grillage were 10-in. H-piles that also are to be used elsewhere on the job.

Six hydraulic jacks supported part of the load to keep it in balance. At each end of the first tier of the grillage, a 70-ton jack was spotted. Two 50-ton jacks working through a transverse beam supported each end of the second tier of the grillage. These six jacks took from 0 to 30 tons of the load as it was placed. Final elements of the load were placed to balance the weight on the jacks as nearly as possible. The total load had to be substantially in excess of 450 tons to result in a net 450-ton load on the jacks.

With the pile test successfully completed, pile driving work has begun on a routine basis by Ben C. Gerwick, Inc., a subcontractor. A 32,000-ft-lb double acting steam hammer (Vulcan 140C) is mounted on 100-ft leads for pile driving operations.

The Richardson Bay Bridge is a project of the California Division of Highways, G. T. McCoy, state highway engineer. The design was accomplished under the direction of F. W. Panhorst, assistant state highway engineer for bridges. W. M. McAuley is resident engineer. Superintendent for the joint venture of the Duncanson-Harrelson Co. and Pacific Bridge Co. is G. W. "Buck" Fink.

HYDRAULIC JACK supports a portion of the load to keep it in balance. Six such jacks were used. Plumb bob detects any torsional movement of load as it is placed.



PILES are driven by rig with 100-ft leads using a double-acting steam hammer.

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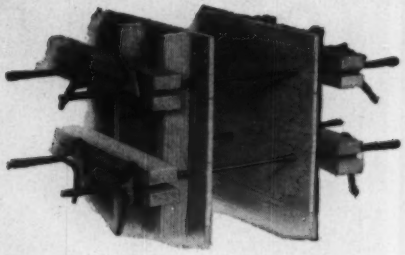
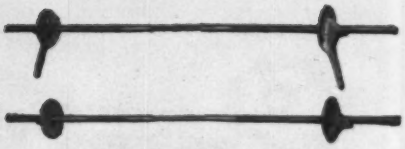
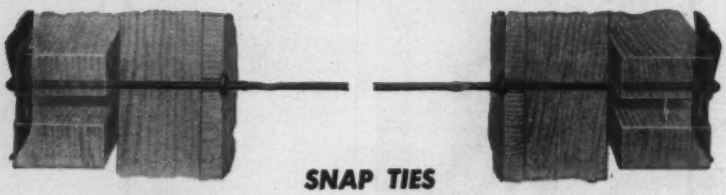


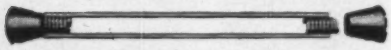


TILT LOCK CLAMPS

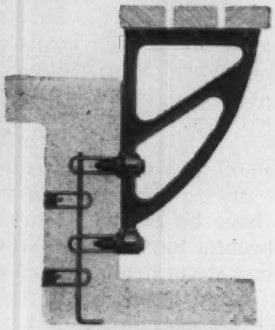


SNAP TIES

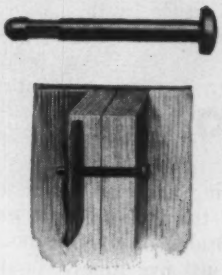
STANDARD COIL TIES



CONE-FAST COIL TIES



RISERFRAMES



PANEL LOCK BOLTS

ROD CLAMPS

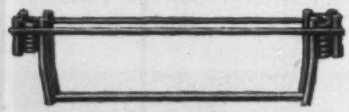
COIL LOOPS

SCREW ANCHORS AND BOLTS

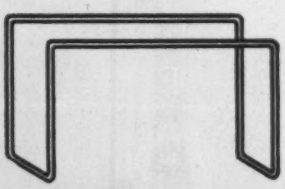
STANDARD HANGER FRAMES

ADJUSTABLE SCREED CHAIRS

"PICK-UP" INSERTS FOR TILT-UP SLABS



SPECIAL HANGER FRAMES



WIRE BEAM SADDLES

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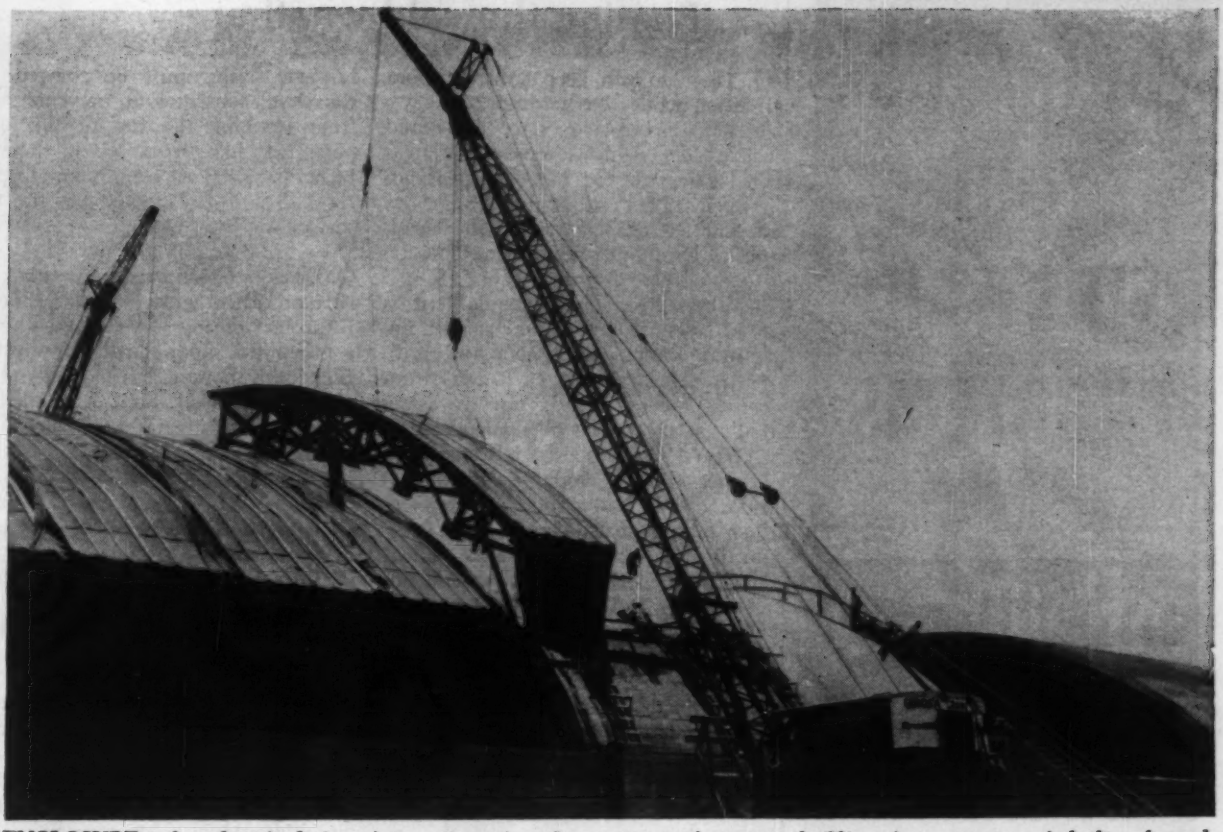

ENCLOSURE to keep heat in during winter construction of some types of concrete buildings is more economical than formerly because larger units can be fabricated and readily handled with crawler cranes.

How Builders Can Beat the Cold Weather

While winter concreting has been carried out successfully for many years, some builders have learned to do it more efficiently and economically than others. To tap this "know-how" and to save many builders the necessity of learning winter lore the hard way, ENR interviewed one who has established an excellent reputation for low-cost winter concreting—N. L. Doe, vice president, Turner Construction Co., New York City. Here are his answers to questions aimed at revealing his techniques:

Q. Is it too costly to erect a concrete building in winter?
A. Beyond a doubt, constructing a concrete building in wintertime is more expensive than in the other seasons. Precautions that are necessary to prevent concrete from freezing are responsible for the extra cost. But if the following recommendations are adopted, the added cost will not be large, and actually there may be a net saving because construction is not delayed by cold weather.

First, a definite program must be arranged based on such factors as type of work to be done, degree of exposure expected and speed required. Plans must be made for warming concrete ingredients, erecting protective enclosures and providing sources of warmth for various parts of the work during the curing period. And form stripping must be scheduled to assure safe results.

It is most important that an able field organization be assembled—from superintendent down to workmen. This organization should be capable of timing concrete operations properly and executing protective measures so that total cost will be at a minimum. Plans should take into account weather forecasts, where concrete is to be placed, and how urgent it is to secure adequate concrete strengths quickly. Care must be taken not only to prevent concrete from freezing but also to avoid overheating and not to waste heat.

Q. Should precautions against freezing await arrival of cold weather?
A. It does not pay to delay start of winter work, or heating of concrete, because it is "only" late fall, or because it is "almost" summer. Once winter work has been decided upon, it is advisable to keep concrete warm and protected whenever the outside temperature does not assist in setting the concrete to any great extent.

Q. How do you prevent the mix from freezing?
A. A satisfactory way is to heat sand and stone for job-mixed concrete by piping live steam beneath canvas-covered aggregate storage piles. Also, warm water should be used, its temperature depending on outside temperatures at time of mixing.

The heating problem for concrete materials has decreased to a great extent with the spread of truck-mixed concrete. It is now generally possible to buy heated concrete delivered to the site.

One point to watch, however, is the capacity of the concrete plant's heating equipment. If the capacity is inadequate, the first few loads delivered may arrive at the right temperature, but later deliveries will be unsatisfactory. The reason the early deliveries may be all right is that the aggregates used have been heated in the bin over night. Aggregates for later deliveries, though, cannot be heated as rapidly as they are passed through the bin.

(*Continued on page 46*)

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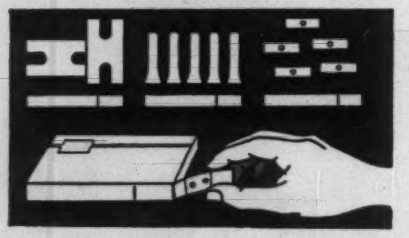

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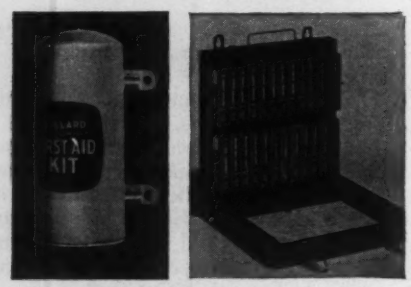

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. . . Beating the cold weather

Q. How do you keep concrete from freezing while it is curing?
A. For curing concrete, coke-fired salamanders and flameproofed canvas enclosures can be used to great advantage. They are comparatively safe if handled properly, and will accomplish the results desired in temperatures normally found in the U. S.

When coke-burning equipment is used, adequate protection against fire is most important. A good rule is to keep the heat source 10 ft away from canvas enclosures. It also is essential that the canvas be flameproof.

Canvas must be securely anchored against wind. A flopping canvas is of little use as protection and indicates poor management. During night shifts on this type of work, it is always advisable to keep two men in attendance because of the hazard from gas and fire.

Oil and gasoline-burning equipment have appeared on the market in recent years in many forms as a source of heat for curing concrete in cold weather. Some of this equipment is quite efficient and can be used to advantage. There are a few precautions to be taken, however:

The type of oil-burning salamander that when tipped over spills its entire contents should be avoided, because of the conflagration that results. Gasoline-burning equipment also is a fire hazard and in addition may be prohibitively expensive to operate because of the cost of the fuel. Furthermore, account should be taken of which trade may claim jurisdiction over the heating units and the effect on cost of operation.

Q. What features do you consider most important when selecting heating equipment?
A. Portability; amount of heat produced; economy of operation, including fuel and labor costs; and safety.

Q. Can use be made of the heat generated when concrete sets?
A. Concrete while setting generates a considerable amount of heat. If the surface of the concrete is properly protected, this heat will be sufficient to prevent it from freezing.

Q. What must be done to retain heat?
A. Frequently, floor slabs can be placed without protection for the top surface, if adequate heat is supplied below and good side wall protection is used. A protective canvas extending 3 ft or more above the floor around the perimeter of the area being concreted forms an effective windbreak. When very cold weather is expected, however, slabs must be covered. If the floor construction prevents heat from reaching the top of the slab, holes may have to be left in the slab to permit the heat from below to pass through and spread out over the top surface.

Q. Do floor finishes require treatment?
A. One of the most difficult elements to protect during very cold weather is a monolithic floor finish. Any protection used above it has a tendency to damage the finish. So it usually is better for the contractor to arrange with the designer to place the finish after the structure has been enclosed.

Q. How can outer walls be protected at low cost?
A. Insulation of the outside wall forms is helpful. If heat is furnished on the inside, very seldom will further protection be necessary.

Q. What can be done about concrete's slow gain of strength in cold weather?
A. One possibility is addition of extra portland cement to the mix. Frequently, use of a stronger mix than actually required by the specifications will keep concrete strengths at a proper value at small expense during cold weather.

Q. Do test cylinders require special handling?
A. Test cylinders must be properly cured in wintertime. If cured at too low a temperature they may give the impression that the concrete in the structure is not of adequate strength, when actually it might be all right.

Also, if cured at too high a temperature, they may encourage stripping forms too soon.

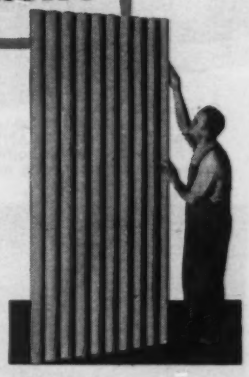
Q. Can concrete be placed any time during the winter?
A. On some days, the exposure may be too severe for concreting to be economical. The job schedule should allow for this contingency. However, during every winter, many days are satisfactory for concrete work. The field organization should be ready for a good pour on such days so that the cost of the work can be kept at a minimum.

Q. Then, you believe low-cost winter concreting is practicable?
A. With proper attention from a good organization, concrete work can be carried out every winter at an economical cost, without much loss of time and to the satisfaction of all concerned.

No costly maintenance problem here

The Johns-Manville Corrugated Transite roof of this oil refinery building will give many years of dependable service, provide protection against fire, and will remain unaffected by the severest weather conditions.

build with Johns-Manville Corrugated Asbestos Transite



- Large sheets go up quickly
- Easy to fasten to steel
- Easy to nail to wood
- Easy to saw
- Easy to drill

For maintenance-free exterior walls and roofs, plus protection from fire, rot and weather

YOU SAVE MONEY on construction and maintenance when you build with Johns-Manville Corrugated Transite®. Corrugated Transite comes in large sheets that require a minimum of framing . . . permits fast economical construction of maintenance-free industrial, commercial, institutional and agricultural buildings.

Made of asbestos and cement, Corrugated Transite is practically indestructible. It never needs paint or special treatment to preserve it . . . it's fireproof, rotproof and weatherproof. Corrugated Transite is also used increasingly for smart interiors . . . the streamlined corrugations and attractive shadow lines that give it such unusual architectural appeal for exteriors offer unlimited interior design possibilities.

Investigate Johns-Manville Corrugated Asbestos Transite and learn how you can build quickly and easily . . . have an attractive, long-lasting, trouble-free structure regardless of size or purpose. For complete details write Johns-Manville, Box 158, Dept. EN, New York 16, New York. In Canada write 199 Bay St., Toronto, Ontario.

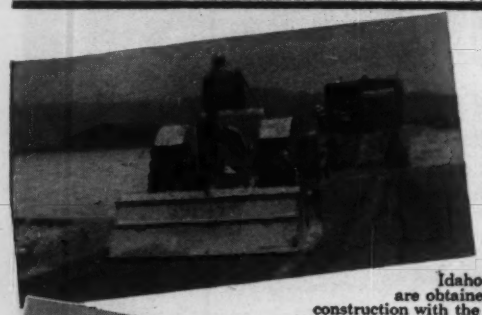
JOHNS-MANVILLE JM PRODUCTS **Johns-Manville**

HOW TO: slash base construction costs

. . . raise load-bearing standards

. . . save thousands of maintenance dollars

with the BIG NEW 1955 SEAMAN



Idaho. High densities are obtained in soil-cement construction with the SEAMAN Self-Propelled Mixer. Here the SEAMAN is mixing, blending and assembling aggregates and mixing in the water increment.

Compaction roller follows immediately behind SEAMAN TRAV-L-PLANT. The SEAMAN finishes to fine grade and crown leaving mix ready for final rolling.

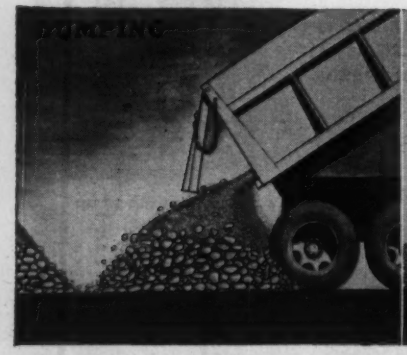
In every field of stabilization, with any material, any binder . . . whether for base, sub-base, shoulder or wear course . . . the SEAMAN MIXER —

SLASHES ORIGINAL CONSTRUCTION COSTS. The PULVI-MIXER attains a thoroughly blended and proportioned mix by the proper mechanical assembly of aggregates and fines, and does it in less time at higher daily output. Consequently the square yard cost for mixing and compaction is drastically cut.

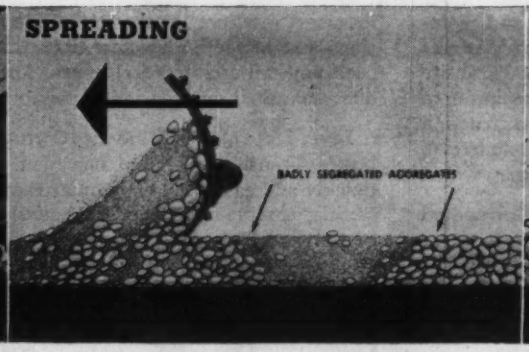
RAISES LOAD-BEARING STANDARDS. Because the PULVI-MIXER in its assembly of materials, keys and interlocks the aggregates and fills the voids with fines to securely mortar-in the larger stone, compaction produces a denser, more tightly knit course, which supports a much higher traffic load.

SECRET OF SEAMAN

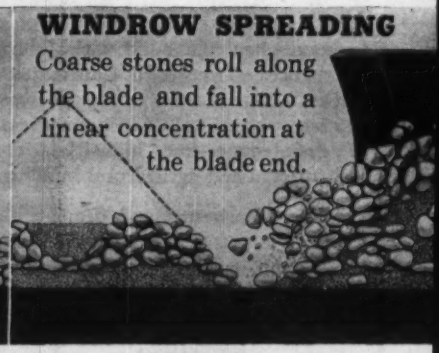
(below)



When gravel is dumped, it forms in piles. Larger stone falls first, the fines last. This segregated condition is highly unstable.



When those piles are leveled alternate pockets of fines and coarse are formed. A base so constructed will soon ravel and break up.



In spreading windrows to final grade fines are concentrated in the windrow "heart." Some fines remain as a pocket, others sift to the bottom. Such segregation also is very unstable.

with 51 improvements!

The SEAMAN Self-Propelled TRAV-L-PLANT. 7 ft. mixing width. Gasoline or diesel powered. Equipped with pump, tachometer assemblies, volumetric meter and spray bar for application of bitumens or water.

PULVI-MIXER

SAVES MAINTENANCE DOLLARS. Stones or aggregates of any size when mortar-locked by the SEAMAN-process are highly immovable, consequently resist moisture penetration and the ensuing damaging effect of traffic. This is true whether the course be simple gravel stabilization or of a higher type employing any of the many available binders. A SEAMAN constructed base or sub-base stands without spring break-up, without raveling, washboarding or maintenance requirement.

EARTH FILLS AND EARTH DAMS. Those same SEAMAN principles, — the elimination of voids, and the blending of soils produce densities in earthwork that range 95% to 100%. Very important is the inter-mixing of the various soil types found in fill material so that uniform reaction to moisture and compaction will result.

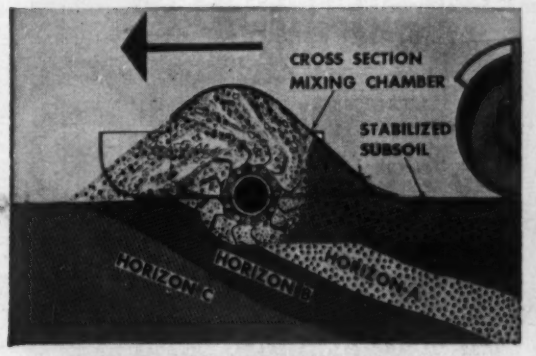
SEAMAN TRAV-L-PLANT in bituminous city street construction.

SEAMAN ANDWALL Corp.

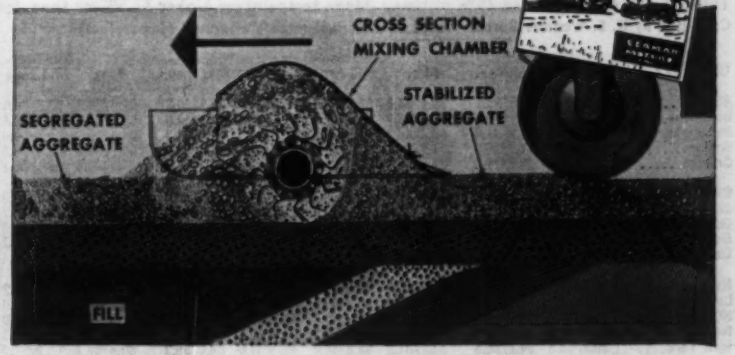
281 N. 25th STREET • MILWAUKEE 3, WIS.

A description of the SEAMAN MIXER and the work it does is detailed in this recent BULLETIN. A postcard request will bring it to you — rush. Just ask for Bulletin TPS.

MIX STABILITY



Here the PULVI-MIXER stabilizes sub-base by blending soil horizons (A, B, C) to attain uniformity in moisture, density and thickness. This prevents sub-base failure.

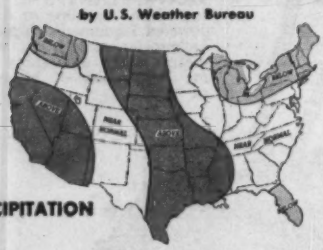


Here the SEAMAN processes aggregate for the base, correcting by proper assembly of materials, an always-present segregated condition. The coarse material is keyed and interlocked, voids are filled with fines to securely mortar-in the larger aggregates.

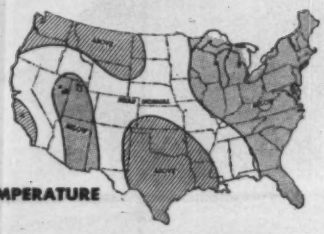
30-DAY WEATHER OUTLOOK

Mid-February to mid-March

by U.S. Weather Bureau



PRECIPITATION



TEMPERATURE

Observed weather in 20 cities, compared with normals

	Precipitation, inches				Temperature, degrees			
	Jan. 1955	Departure fr. normal	1 mo. 1955	Departure fr. normal	Mean Jan. 1955	Departure fr. normal	Av. daily maximum	Av. daily minimum
Atlanta	4.93	+0.26	.....	.....	43.6	+1.0	52.1	35.1
Baltimore	0.29	−3.37	.....	.....	34.9	−1.7	41.6	28.1
Birmingham	4.70	−0.28	.....	.....	43.5	−1.7	53.6	33.3
Boston	0.92	−2.58	.....	.....	28.5	−0.6	34.7	22.2
Chicago	1.49	−0.35	.....	.....	24.9	0.0	31.4	18.3
Cincinnati	2.63	−0.81	.....	.....	31.3	−1.8	38.3	24.2
Cleveland	2.22	−0.16	.....	.....	26.9	−1.6	33.2	20.6
Dallas	1.35	−1.12	.....	.....	46.7	+1.0	55.6	37.8
Denver	0.15	−0.35	.....	.....	30.8	−0.6	40.5	21.6
Detroit	1.69	−0.39	.....	.....	26.3	+0.1	31.6	20.9
Kansas City	2.19	+0.76	.....	.....	32.5	+2.5	40.7	24.2
Los Angeles	4.30	+1.92	.....	.....	53.7	−1.3	61.9	45.4
Minneapolis	0.47	−0.33	.....	.....	14.0	−0.5	21.2	6.9
New Orleans	6.48	+1.70	.....	.....	54.4	−1.5	62.5	46.2
New York	0.81	−2.65	.....	.....	30.5	−2.4	36.1	24.8
Philadelphia	0.45	−2.92	.....	.....	32.6	−0.6	39.0	26.2
Pittsburgh	1.02	−1.81	.....	.....	30.8	−2.2	37.3	24.3
St Louis	1.52	−0.80	.....	.....	34.0	+0.7	41.7	26.3
San Francisco	4.05	+0.02	.....	.....	48.1	−2.0	53.4	42.8
Seattle	2.07	−2.42	.....	.....	42.5	+1.8	46.0	39.0

Precipitation range in 20 cities, in inches

Table shows range observed 33.3% of time. Rainfall heavier 33.3% of time, lighter 33.3% of time.

Computed by U. S. Weather Bureau (based on historical records of actual precipitation)

City	Feb.	Mid Feb.-Mid Mar.	Mar.	Mid Mar.-Mid Apr.	Apr.	Mid Apr.-Mid May	May	Mid May-Mid June	June	Mid June-Mid July	July	Mid July-Mid Aug.	Aug.	Mid Aug.-Mid Sept.
Atlanta	3.36/5.67	3.40/6.00	3.43/6.33	3.12/5.72	2.82/5.10	2.48/4.72	2.14/4.33	2.50/4.38	2.87/4.43	2.93/4.62	2.99/4.80	2.89/4.90	2.79/5.00	2.24/4.30
Baltimore	2.36/3.39	2.48/3.76	2.59/4.13	2.59/4.17	2.58/4.20	2.76/4.30	2.94/4.40	2.73/4.42	2.52/4.44	2.57/4.71	2.61/4.98	2.91/5.32	3.20/5.66	2.65/4.51
Birmingham	3.47/5.88	4.18/6.26	4.48/6.63	3.91/5.85	2.94/5.07	3.05/4.81	3.16/4.55	2.90/4.70	2.64/4.84	3.29/5.18	3.94/5.53	3.44/5.39	2.92/5.25	2.32/4.47
Boston	2.64/3.93	2.79/4.22	2.94/4.50	2.66/4.45	2.39/4.40	2.58/4.29	2.39/3.50	2.42/3.84	2.09/3.50	2.35/3.76	2.61/4.02	2.60/4.36	2.59/4.70	2.32/4.20
Chicago	1.52/2.23	1.76/2.67	1.99/3.11	2.09/3.12	2.19/3.13	2.24/3.56	2.16/4.00	2.29/3.83	2.42/3.67	2.46/3.66	2.49/3.65	2.31/3.65	2.13/3.65	2.11/3.70
Cincinnati	1.80/3.00	2.10/3.64	2.39/4.29	2.66/3.94	2.34/3.60	2.42/3.85	2.49/4.10	2.59/4.30	2.69/4.50	2.54/4.10	2.39/3.70	2.32/3.95	2.24/4.20	2.02/3.64
Cleveland	1.51/2.43	1.81/2.71	2.10/2.98	2.15/3.13	2.20/3.27	2.27/3.38	2.33/3.49	2.17/3.53	2.00/3.56	2.24/3.82	2.47/4.08	2.15/3.84	1.83/3.60	2.07/3.51
Dallas	1.59/2.30	1.96/3.08	2.34/3.86	2.50/4.68	2.66/5.50	2.82/5.38	2.99/5.25	2.39/4.85	1.79/4.45	1.59/3.72	1.39/3.00	1.30/2.89	1.22/2.78	1.50/2.94
Denver	0.34/0.58	0.46/0.84	0.59/1.10	0.96/1.75	1.34/2.40	1.48/2.65	1.62/2.90	0.64/2.32	0.67/1.75	0.94/1.88	1.21/2.00	1.04/1.86	0.87/1.73	0.60/1.39
Detroit	1.51/2.50	2.14/2.64	1.77/2.78	1.78/2.76	1.79/2.73	2.14/3.20	2.49/3.67	2.66/3.88	2.84/4.10	2.46/3.90	2.09/3.70	1.94/3.54	1.79/3.38	1.80/3.41
Kansas City	0.99/1.90	1.29/2.40	1.59/2.90	1.99/3.15	2.39/3.40	2.82/4.40	3.24/5.40	3.42/5.82	3.61/6.25	3.19/5.47	2.77/4.69	2.74/4.84	2.70/5.00	2.84/5.00
Los Angeles	0.99/3.20	1.06/3.08	1.13/2.95	0.68/1.92	0.22/0.90	0.14/0.62	0.05/0.35	0.02/0.18	0.00/0.02	0.00/0.01	0.00/T	0.00/T	0.00/T	0.00/0.02
Minneapolis	0.52/1.08	0.75/1.38	0.98/1.67	1.34/2.14	1.69/2.60	2.16/3.29	2.64/3.98	2.89/4.49	3.14/5.00	2.64/4.50	2.14/4.00	2.10/3.85	2.1w/3.70	2.24/3.78
New Orleans	2.79/4.70	3.00/5.00	3.22/5.30	2.94/5.15	2.66/5.00	2.65/5.12	2.64/5.25	3.18/5.88	3.72/6.50	4.54/6.95	5.37/7.40	4.90/7.08	4.44/6.75	3.78/6.12
New York	2.36/4.10	2.35/4.08	2.34/4.05	2.40/3.92	2.47/3.78	2.50/3.90	2.54/4.02	2.45/3.91	2.36/3.80	2.81/4.25	3.26/4.70	2.99/4.95	2.89/4.70	2.46/4.30
Philadelphia	2.57/3.68	2.60/3.84	2.62/4.00	2.56/3.91	2.49/3.82	2.44/4.11	2.39/4.40	2.54/4.25	2.69/4.10	2.94/4.24	3.19/4.37	2.99/4.91	2.79/5.45	2.44/4.62
Pittsburgh	1.77/2.83	2.06/3.15	2.34/3.47	2.32/3.44	2.29/3.40	2.39/3.58	2.49/3.75	2.68/3.98	2.86/4.20	2.79/4.35	2.72/4.50	2.52/4.15	2.32/3.80	2.20/3.30
St. Louis	1.57/2.90	1.92/3.42	2.27/3.95	2.43/3.88	2.59/4.10	2.86/4.65	3.13/5.20	2.96/5.25	2.79/5.30	2.60/4.78	2.41/4.25	2.28/4.18	2.14/4.11	2.12/3.84
San Francisco	1.99/4.71	1.96/4.13	1.94/3.55	1.30/2.54	0.67/1.54	0.44/1.12	0.18/0.69	0.09/0.37	0.00/0.05	0.00/0.03	0.00/0.01	0.00/0.00	0.00/0.00	0 00/0.13
Seattle	2.55/4.60	2.18/4.02	1.81/3.43	1.76/3.16	1.64/2.90	1.53/2.45	1.42/2.00	1.09/1.86	0.76/1.73	0.48/1.20	0.19/0.67	0.18/0.78	0.18/0.90	0.62/1.55

T—Traces (Less than 0.005 inches)

Mean temperature range in 20 cities, in degrees F.

Table shows range observed 25% of time. Mean temperature higher 37.5% of time, lower 37.5% of time.

Computed by U. S. Weather Bureau (based on historical records of actual temperature)

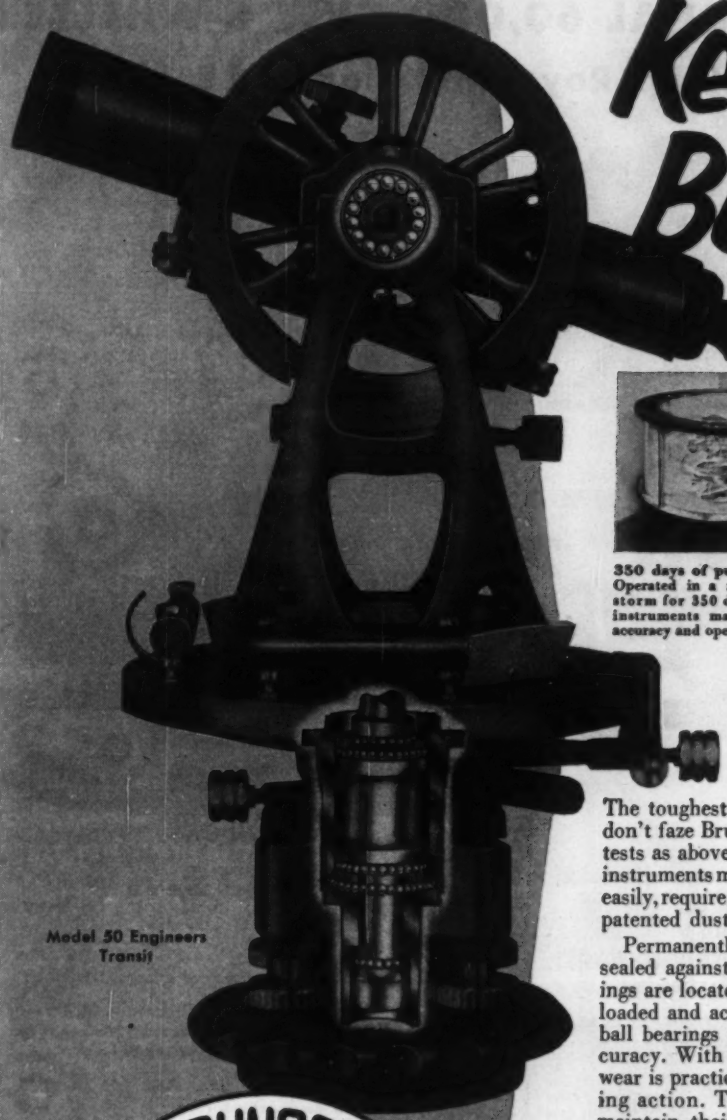
City	Feb.	Mid Feb.-Mid Mar.	Mar.	Mid Mar.-Mid Apr.	Apr.	Mid Apr.-Mid May	May	Mid May-Mid June	June	Mid June-Mid July	July	Mid July-Mid Aug.	Aug.	Mid Aug.-Mid Sept.
Atlanta	45.1/47.9	47.5/50.1	51.2/53.6	55.9/58.0	60.9/62.6	64.9/66.3	69.0/70.5	73.5/74.6	77.3/78.1	78.5/79.3	79.0/79.9	78.9/79.9	78.6/79.1	76.3/78.1
Baltimore	34.6/38.0	38.1/41.7	42.0/45.7	46.6/49.4	51.9/53.6	57.5/59.0	63.4/64.6	68.2/69.5	72.5/73.8	75.2/76.6	76.2/77.5	75.5/77.3	73.6/75.7	71.1/73.3
Birmingham	46.0/49.4	48.8/51.7	52.4/54.7	56.6/58.5	61.1/62.6	64.6/65.3	68.4/70.2	72.4/74.5	76.8/78.1	78.4/79.7	78.9/80.0	79.0/80.3	78.5/79.8	76.6/78.5
Boston	27.8/30.0	31.4/34.0	35.6/38.6	41.1/43.3	46.7/48.3	51.5/53.1	56.7/58.4	56.8/58.6	66.3/68.1	69.6/71.1	70.2/74.1	72.1/73.4	70.9/72.1	67.6/69.2
Chicago	24.7/30.0	29.2/34.2	34.6/39.1	40.9/43.8	47.5/48.8	52.7/54.7	57.9/60.5	63.1/66.1	68.0/71.2	71.6/74.0	73.7/75.1	73.8/75.4	71.7/72.0	68.8/70.7
Cincinnati	31.6/36.0	35.2/39.2	39.6/43.1	45.4/48.1	51.4/53.3	56.4/58.6	61.5/64.0	65.2/67.0	71.2/73.0	73.4/75.2	74.1/75.8	73.9/75.7	72.5/74.4	70.2/72.1
Cleveland	26.2/29.7	29.8/33.7	34.7/38.8	40.3/43.2	46.2/47.8	51.8/53.9	57.9/60.3	63.5/65.7	68.2/70.2	71.2/73.0	72.7/74.2	72.5/74.2	70.9/72.7	68.5/70.6
Dallas	48.8/52.2	51.9/55.6	55.5/59.6	60.1/63.7	64.2/67.3	68.4/71.1	72.6/75.0	77.2/78.8	81.1/82.2	83.3/84.8	84.5/86.4	85.6/87.3	85.1/86.7	82.3/83.9
Denver	30.5/34.7	33.1/36.8	35.9/39.1	40.4/43.2	46.3/48.6	51.1/53.4	55.2/57.4	60.0/62.1	65.4/67.5	69.7/71.5	72.1/73.7	72.5/74.0	71.8/72.2	67.3/78.6
Detroit	24.6/28.9	27.9/32.1	33.1/37.2	39.3/42.1	45.6/47.1	51.0/52.8	56.5/58.7	62.3/64.4	67.3/69.9	70.6/72.1	72.5/73.5	72.3/73.6	71.0/72.5	67.5/69.5
Kansas City	32.2/37.1	37.3/41.2	41.9/45.9	48.6/51.3	54.7/56.7	59.9/61.7	64.6/66.4	69.4/71.2	74.2/76.0	78.0/79.6	80.0/81.5	80.2/81.8	78.4/80.1	74.6/76.6
Los Angeles	52.9/55.1	54.1/56.3	55.4/57.4	56.6/58.4	58.1/59.7	58.8/61.3	61.4/62.8	62.5/64.0	63.9/65.4	65.4/67.0	66.9/68.4	67.5/68.9	67.4/68.6	66.8/68.1
Minneapolis	15.0/20.8	21.7/25.9	29.9/32.5	37.3/40.3	44.7/47.9	51.3/54.4	57.2/60.2	62.2/64.9	66.6/69.1	70.3/72.5	72.9/74.9	73.2/75.0	70.8/72.3	66.3/68.4
New Orleans	55.9/59.3	57.6/60.8	60.6/63.0	63.4/65.7	67.4/69.1	70.7/72.1	73.8/74.9	77.0/78.1	79.9/80.9	81.0/81.9	81.4/82.3	81.8/82.7	81.8/82.7	80.8/81.9
New York	30.9/33.6	34.1/36.8	38.7/41.3	43.6/46.0	49.0/51.0	54.6/56.3	60.6/62.1	65.9/67.5	70.4/72.2	73.6/75.0	75.2/76.3	75.1/76.3	73.6/74.9	71.0/72.5
Philadelphia	32.3/35.3	36.4/39.2	40.8/43.5	45.6/47.9	50.8/52.6	56.2/58.0	62.3/64.0	67.5/69.2	71.5/73.1	74.1/75.4	75.8/76.6	75.1/76.3	74.5/73.3	72.1/70.6
Pittsburgh	26.9/32.0	30.5/35.4	36.0/40.6	43.9/46.5	48.0/49.8	53.1/55.1	58.7/60.9	63.5/65.8	67.4/69.7	70.2/72.0	71.4/72.8	71.0/72.4	69.3/70.9	67.2/68.9
St. Louis	33.7/38.1	37.8/41.8	42.9/46.3	48.6/51.5	54.5/57.0	59.8/63.3	64.0/66.6	68.7/71.5	73.5/76.2	76.9/79.0	78.7/80.2	78.5/80.1	76.7/78.5	73.6/75.6
San Francisco	50.0/51.7	51.0/52.8	52.4/55.1	52.4/54.2	53.2/55.0	54.3/55.9	55.9/57.4	57.5/59.1	58.8/60.5	59.6/61.0	59.7/60.9	59.5/60.7	60.1/61.2	60.9/62.2
Seattle	39.7/42.0	41.7/43.3	43.6/44.7	45.8/47.2	48.2/49.9	51.0/52,9	54.2/56.3	56.9/58.5	59.3/60.4	61.7/62.7	63.6/64.6	63.8/65.0	62.7/64 1	60.8/62.0

Under toughest conditions of dust, heat, cold... this transit

Keeps its Bearings!

350 days of punishing dust! Operated in a man-made dust storm for 350 days, Brunson instruments maintain perfect accuracy and operability.

Temperatures from —70° to 160°F! Exposed to punishing extremes of temperature, Brunson instruments move freely in "arctic" cold or "desert" heat.



Model 50 Engineers Transit

The toughest doses of dust, heat, cold, and moisture don't faze Brunson instruments! Through such severe tests as above and years of hard service, these unique instruments maintain highest possible accuracy, operate easily, require negligible servicing. The reason: Brunson's patented dustproof, ball bearing construction.

Permanently lubricated by an all-weather grease and sealed against dust and moisture, Brunson ball bearings are located in the spindle and telescope axis. Preloaded and accurate to 5-millionths of an inch, these ball bearings provide highest possible instrument accuracy. With dust sealed out and lubricant sealed in, wear is practically eliminated by the smooth ball bearing action. That's why only Brunson instruments maintain their accuracy for years. That's why they *keep their bearings*—free from injurious wear, free from the need for cleaning or lubrication, free from the need of repairs or replacements.

Brunson instruments with exclusive ball bearing construction cost no more—offer lots more. Mail coupon today. You'll be glad you did!

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NEW

INTERNATIONAL 60,000 GVW 6-WHEELER

With New 212 hp. Royal Red Diamond Engine

There's a new model in the INTERNATIONAL line of 6-wheelers — a model with the power to haul capacity loads over the roughest terrain — a model built to absorb severe loading shocks, and with ability to move heavy loads long distances over-the-road at maximum safe speeds.

The new RF-230 is powered by the new INTERNATIONAL 212 hp. Royal Red Diamond 501 engine delivering 444 lb-ft torque at 1600 rpm. It has hydraulic full-power steering, 12-volt electrical system, other features. Engine and all components are precisely coordinated to assure maximum operating economy, minimum maintenance and long life.

This newest INTERNATIONAL is Tough-Job engineered like all INTERNATIONALS — has a surpassing measure of the performance, strength and stamina qualities that have made INTERNATIONAL the 6-wheel sales leader for 20 straight years. It is built to do big jobs, save big money. Get full facts from your INTERNATIONAL Dealer or Branch.

QUICK FACTS...

GVW rating, 60,000 lbs.

Wheelbase, 175 inches; optional wheelbases available.

Engine, INTERNATIONAL Royal Red Diamond 501, 4½-inch bore, 5¼-inch stroke, 501 cu. in. displacement. Max. hp., 212 at 3000 rpm. Max. torque, 444 lb-ft at 1600 rpm.

Frame, double, heat-treated alloy steel. Two 15,000 lb. capacity front tow hooks, standard.

Clutch, 15-inch single plate with vibration damper.

Transmission, direct-in-fifth main plus overdrive auxiliary.

Standard equipment includes hydraulic full-power steering, air brakes, 12-volt electrical system.

Optional equipment includes LPG fuel system, Comfo-Vision space saver cab for maximum front axle loading; high altitude engine equipment; tinted safety glass all around.

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INTERNATIONAL® TRUCKS

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Preformed Foam Fill

Assembly line methods and foam cut insulating costs

A new method for producing cellular concrete, called the National-Crete System, has been used for the first time on a large structure in the construction of a 60,000 sq ft insulating roof fill atop a new Sears, Roebuck & Co. retail store in Philadelphia.

The new system involves the generation of foam by aerating a protein-base compound through a nozzle and adding it to the concrete in place of the usual aggregates. According to the manufacturers, the preformed" foam method enabled the general contractor, the Baton Construction Corp., to use "assembly line" techniques in making the installation, mixing and pouring 15 cu yds of concrete an hour.

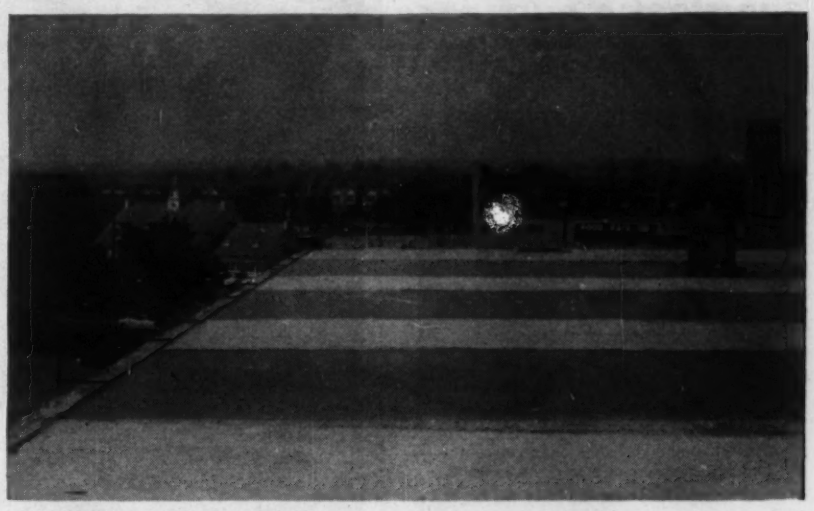
A 5-cu yd, end-loaded transit mixer, parked under a working platform, was used to prepare the cellular concrete. Sacked cement was transported to the platform by conveyor where it was dumped into the mixer through a hopper and chute arrangement. When a batch of cement and water slurry had been thoroughly mixed, the required amount of foam was directed into the mixer and the drum given the additional number of turns required to distribute the air cells.

The skip bucket, installed in a hoisting tower immediately adjacent to the mixer discharge, hauled the foamed concrete to the roof where it was discharged into a storage hopper and then to concrete buggies.

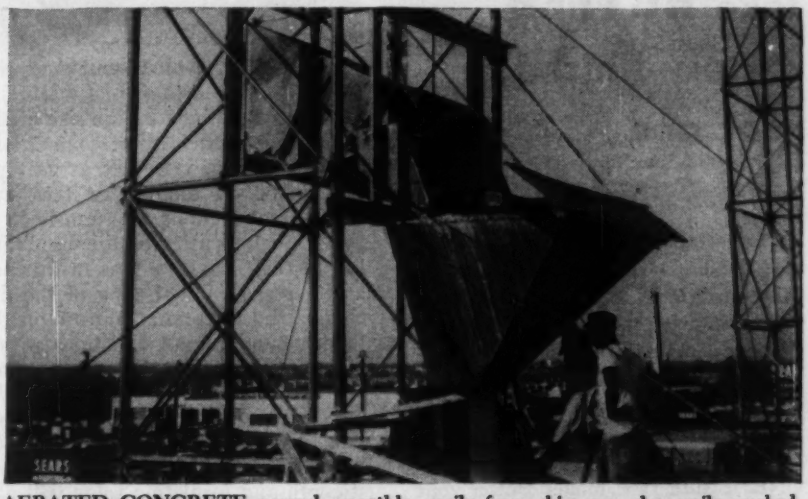
The roof area was divided into 12-ft wide strips separated by pipe or wood forms into which the foamed concrete was poured to a depth of 3 in. Alternate strips were poured so that as every other section set, the forms could be removed and the intervening area filled. It is reported that the mix was very easy to handle, and a screed finish was all that was required to produce a smooth surface.

With the National-Crete System, the manufacturer supplies a premix solution tank, a foam-making nozzle with two lengths of 15-ft hose and a quantity of foam liquid.

The premix tank is filled with a solution of foam liquid and clean water. Compressed air then forces this solution through the nozzle—similar to a CO_2 fire extinguisher nozzle—to produce what is said to be a stable and uniform foam. The nozzle is pre-set to deliver 60 or 120 gpm of foam with



ALTERNATE POURING of 12-ft wide strips eliminated half of the forming required.



AERATED CONCRETE poured smoothly, easily from skip, was also easily worked.

FOAM AND CEMENT were charged into 5-yd transit mixer located under platform.

There's a Big difference in steel buildings...

A Butler steel building houses the Santa Cruz plant of A. R. Wood & Co., manufacturers of brooders and poultry equipment.

take BUTLER factory-finished roof and side panels

... for instance. It's easy to spot Butler steel buildings. They have that pleasing, tailor-made look. Butler quality is more than skin-deep, too. Every single roof and side panel is factory die-formed, precision sheared and punched. These precision operations guarantee a building that permanently seals out tropic heat or arctic cold. Superior panels are ONLY ONE feature that makes Butler your best steel building buy ... priced at the lowest figure you can safely pay for a *quality* building. Mail coupon today for all the facts.

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Please mail more information on Butler steel buildings.

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PREFORMED FOAM consists of air bubbles said to withstand mixing abrasion.

the rate determined by the size of the mixer and the density of concrete desired. A safety valve set at 100 psi is installed on the premix tank and snap-on connections are furnished.

Although density of the insulating fill on the Sears roof was maintained at 40 lb per cu ft, timing of the discharge and therefore control of the foam volume permit variations within practical limits. A neat cement mix can be varied between 10 and 55 lb per cu ft and a 1:2 mix of cement and sand can be varied between 45 and 100 lb (plus) per cu ft. Compressive strength and insulating value will naturally vary with the density of the end product.

Cost will also vary, but in comparison with usual aggregates it is a negligible factor. To produce the 40-lb-per-cu-ft fill used on the Sears roof it was necessary to add approximately 130 gal of foam per yd of concrete at a cost of about 75¢. Yield on the Sears roof was about 5 yd of concrete for 32 sacks of cement.

The manufacturer emphasizes that besides being an economical and easily controlled method of producing cellular concrete, the National-Crete process adds a "lubricating" quality to the mix. Thus it can be poured into intricate forms with reasonable success assured and cuts down on the labor required for both placing and finishing. NATIONAL FOAM SYSTEM, INC., WEST CHESTER, PA.

Allis-Chalmers Improves Tractor Shovel

A new Allis-Chalmers 2 yd. model HD-9G tractor shovel, with design modification and construction improvements, is said to offer greater productivity, longer life, maintenance simplicity, ease of operation and maximum visibility.

The new tractor shovel produces 100 net engine hp and 82 drawbar hp. With a low gear speed of 1.4 mph, the HD-9G develops 23,000 lbs. pull at the drawbar.

The improved unit also incorporates a new ceramic master clutch lining originally developed for aircraft wheel brakes. This new type clutch lining reportedly operates longer between adjustments, reduces lever pull for easier operation and offers increased clutch life.

A completely new bucket design is said to make digging, loading, and dumping easier, faster and cleaner with reduced spillage. A deeper box section and replaceable wear plates assertedly give added strength, longer bucket life.

The new hydraulic system in the HD-9G practically eliminates external hoses, fittings and hardware. According to the manufacturer, a new style hydraulic tank with enclosed manifold, piping, relief valves and diverter valve to operate rear-mounted equipment, eliminates outside leaks for safer operation. Short, external piping

is directed under the seat to the left side lift and dump cylinders, and the cowl and deck of the HD-9G are free of any hoses to offer improved operator visibility.

The improved hydraulic pump for the tractor shovel, driven from the front end of the engine crankshaft, operates in a medium pressure range. Features include pressure-compensated wear plates, floating gears and a high pressure-type shaft seal, designed to give fast and accurate bucket action on any phase of shovel operation.

The new type shovel side frames are mounted on the tractor rigid beam with wedge blocks to maintain rigidity. The upper parts of these frames are connected across the tractor with a built-in stabilizer which becomes the cowl of the tractor. The low design of the stabilizer-cowl also aids operator visibility.

A new addition to the attachments available for the HD-9G is the Tip-Back bucket which allows the operator to roll the bucket back approximately 25 deg at ground level. For handling greater capacities of loose stockpiled materials, the Tip-Back bucket can be carried lower to the ground for greater stability and, it is said, can load bulky objects easier. ALLIS-CHALMERS MFG. CO., TRACTOR DIV., MILWAUKEE 1, WIS.

Lorain's ½ and ¾-yd Rigs Now Have Smoother Controls

Lorain machines in the ½ and ¾-yd classes are now equipped with "E-Z" action controls that are said to reduce the effort required on the operating levers by 70% and afford easy operation and fast response.

Operating levers have been streamlined and slenderized in appearance and move on roller bearings. Further, they actuate the clutches through a simpler linkage in which the number of parts has been reduced and easier, faster response is achieved through the use of 19 anti-friction bearings.

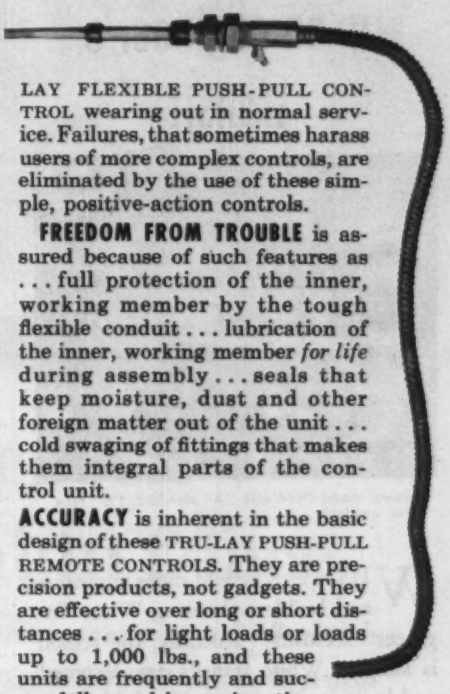
Along with the improvement in the operating controls, the hoist and drag shoe type clutches have been redesigned to include: an improved dead end linkage said to eliminate all adjustment at the dead end of the shoe; and a new spring-loaded live end that reportedly reduces operating effort and also reduces adjustment frequency because the shoe automatically follows the clutch drum to maintain the proper adjustment. Further improvement in clutch action is obtained by newly designed operating cones that provide for easier clutch engagement. THEW SHOVEL CO., LORAIN, OHIO.

THESE REMOTE CONTROLS WILL DO THEIR JOB UNFAILINGLY, UNDER THE TOUGHEST OPERATING CONDITIONS

Engineers for 30 leading manufacturers told us why their construction equipment performs better for users with TRU-LAY PUSH-PULL REMOTE CONTROLS.

These engineers have adopted TRU-LAY PUSH-PULLS on a wide range of equipment (power shovels, excavators, winches, graders, road oilers, dump trucks, engine driven pumps, crushing plants, snow plows, etc.) for the Remote Control of Transmissions, Hydraulic and Air Valves, Brakes, Clutches, Throttles, Chokes, Governors, Power Take-Offs, Feed and Delivery Conveyors and other applications.

The net of what these engineers had to say collectively was this: These FLEXIBLE PUSH-PULLS make possible More Efficient Design . . . Dependable Operation of controls under the most adverse conditions (Hot as jet engines—Cold to −70° F.—Soakin' Wet—Abrasive—or just plain Tough) . . . Accurate, Precise Control . . . virtual Elimination of Maintenance.



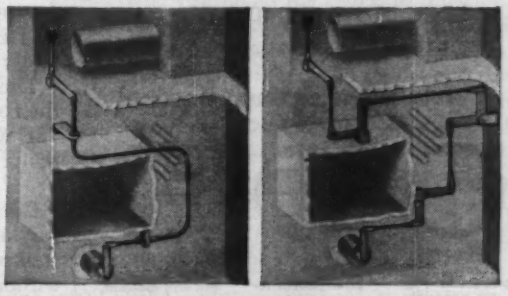
LONG LIFE is a matter of record. We have never heard of a TRU-LAY FLEXIBLE PUSH-PULL CONTROL wearing out in normal service. Failures, that sometimes harass users of more complex controls, are eliminated by the use of these simple, positive-action controls.

FREEDOM FROM TROUBLE is assured because of such features as . . . full protection of the inner, working member by the tough flexible conduit . . . lubrication of the inner, working member *for life* during assembly . . . seals that keep moisture, dust and other foreign matter out of the unit . . . cold swaging of fittings that makes them integral parts of the control unit.

ACCURACY is inherent in the basic design of these TRU-LAY PUSH-PULL REMOTE CONTROLS. They are precision products, not gadgets. They are effective over long or short distances . . . for light loads or loads up to 1,000 lbs., and these units are frequently and successfully used in conjunction with Hydraulic, Air and Electric Controls.

to give you this simple and effective assembly

. . . rather than this complex (and expensive) series of linkages



"SOLID as a rod but FLEXIBLE as a wire rope" is a good description of TRU-LAY PUSH-PULL CONTROLS. This flexibility provides positive remote-action whether anchorages are fixed or movable . . . it damps out noise and vibration, and greatly simplifies installation of controls by reducing the number of working parts and by making it possible to snake around obstructions.

Whether your interest is in a single application of this versatile and dependable PUSH-PULL CONTROL, or in its inclusion as a component of the product you manufacture, the six bulletins and booklets in this DATA FILE will answer your further questions. They will also provide you with the means of defining to us the application you may be interested in.

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White gives you everything you want in an engineer's transit

Shown, model 7014 with "A" standard, "U" type also available.

WHY are more and more engineers and builders choosing White Engineers' Transits? Basically, the reason is simple: White transits are designed and built for the man in the field. They incorporate all the work-saving, accuracy-boosting features . . . the rugged construction . . . the simplified quality components that you want. In addition, you get coated optics, covered leveling screws and internal focusing Telescope. Wide frame tripod is optional.

YOUR CHOICE OF THREE RETICULES AS SHOWN BELOW —

Fig. I Cross hair arrangement for our standard levels.

Fig. II Stadia hair arrangement for our standard transits.

Fig. III Special stadia hair arrangement, furnished upon request.

To get the details on the complete White line of instruments for Engineers, Surveyors and Builders, write for Bulletin 1053. DAVID WHITE COMPANY, 343 W. Court Street, Milwaukee 12, Wisconsin.

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RESEARCH

How Air Conditioning Works in Practice

Research shows current equipment can keep houses comfortable but there still are performance bugs to be eliminated

Whatever shortcomings present types of residential air-conditioning equipment may now have, they at least maintain comfort conditions. This is made clear in progress reports on Austin Village, a research project in which the performance of several types of equipment in actual use was studied.

The progress reports were presented by Ned Cole, project manager for the National Association of Home Builders Research Institute, and C. W. Nessell, director, Mobile Laboratory, National Warm Air Heating and Air Conditioning Assn., at the NAHB-convention in Chicago (ENR Jan. 27, p. 25).

• **Practical goals**—Purpose of the research project was to determine under actual residential living conditions the following: information concerning layout, installation and operation of equipment; and information indicating construction details required for the economical air conditioning of houses. Austin Village, consisting of 22 houses with different equipment and construction, was built last June in Austin, Texas, and the purchasers, as well as the equipment, have been kept under observation thereafter.

Design temperature for Austin for the cooling cycle is 100F dry bulb and 78F wet bulb. Last summer's design temperature was 3F dry bulb higher.

• **Comfort conditions maintained**—By varying the three elements of comfort (temperature, humidity and air flow) without the knowledge of occupants and checking their reactions, the researchers found that comfort could be defined as follows:

1. Constant air movement
2. Humidity range from 40% to 60%
3. Temperatures from 75F to 78F

According to Nessell, the owners generally are satisfied with the cooling the installations are giving them and are not disturbed over costs. There is some indication that air conditioning is changing living habits and perhaps contributing to better health.

But much of the equipment is operating at a higher noise level than 40 decibels, an upper limit suggested in FHA requirements. While manufacturers can improve the equipment, the researchers report that it will also be necessary for builders and architects to isolate the equipment from the structure both physically and acoustically.

• **What conditioning cost**—Estimates of operating costs (actual cooling costs and computed heating costs) indicate that for the best performances in the project, annual cost will be $120 (Austin rates: 1.61 cents per kwh for electricity, 25c per thousand gallons of water and 60c per thousand cubic feet of gas). Operating costs for cooling varied from $0.80 to $1.46 per day per house, the average being $1.06 per 24-hr period. Expressed in terms of cost per day per sq ft of floor per degree outside temperature exceeding 80F indoor design temperature, these figures become $0.0000835 to $0.000177, with an average of $0.000125. Thus, one cent per day cooled roughly 80 sq ft of floor area under Austin design conditions.

Installation costs varied from a high of $453 to a low of $138, averaging $285. Electrical installation was the highest single item; duct installation, second.

• **Costs can be cut**—The researchers also found that initial costs are higher than necessary because:

1. Builders are not familiar with the equipment and fail to allow proper space, facilities, utilities and timing for the installation.
2. The trades, particularly plumbing and electric, do not understand the extent of their work on the air-conditioning system.
3. An alarming number of dealers handling this equipment are unable to install it properly and are not able to direct others to do so.

The researchers believe that most of these difficulties can be eliminated by more prefabrication of the air-conditioning system components: Pre-wired "plug-in" system with one three-wire 220-v electrical connection in the field; pre-wired electrical control system with a low-voltage plug-in thermostat; and prefabricated ductwork with integral insulation and vapor seal.

It was also found that the efficiency

of the system dropped rapidly if ducts were not insulated adequately.

Water consumption in a maximum 24-hr period was 138 gal with an atmospheric tower, and an average of 52 gal with a forced-draft or evaporative system.

A final report on heating and cooling cycles is expected next September.

Fire Resistance of Open-Web Steel-Joist Floors Tested

The National Bureau of Standards has recently carried out a research program on the fire resistance of open-web steel-joist floors protected with wire-reinforced lightweight aggregate plaster. Conducted by J. V. Ryan and E. W. Bender of the NBS fire protection laboratories, the studies involved a total of 18 fire tests.

Specimens were constructed according to regular building practices with floor main members assembled from open-web steel joists upon which concrete slabs were cast. To the bottom chords of the joists were attached steel furring channels and lightweight ceilings of gypsum-perlite plaster on perforated gypsum lath.

Various methods of supporting the ceilings were used, and in some of the tests one of two types of additional reinforcement was included. The supporting systems consisted of differently formed wire and sheet metal clips by which the gypsum lath was attached to the furring channels. The clips were specially designed for easy and rapid construction. Additional reinforcements were either straight wires or wire mesh of 1 in. hexagonal openings ("chicken wire"), secured below the lath before application of the plaster. The plaster was applied in various thicknesses from ½ to 1¼ in.

Results of the tests indicate that floor-ceiling assemblies of this type of construction should provide fire resistance from 1 hour to more than 4 hours—a range adequate to cover building code requirements. Increased plaster thickness up to 1 in. is accompanied by an increased time of fire resistance, to a maximum of 1¾ hours before failure occurs. More than 1 in. of plaster, however, gives practically no additional fire protection. On the other hand, use of additional reinforcement in the ceilings increases the fire resistance time to 3¼ hours with diagonal wires, and to 4½ hours with chicken wire. The plaster in these reinforced ceilings was 1 in. or less in thickness.

The check he couldn't face

How the forged endorsement on a $73 check led us to discovery of a $6300 payroll fraud

(Based on Company File #117044)

One day recently, a former employee strode into our treasurer's office. Where was his vacation allowance money? He'd been waiting six months and hadn't received it.

We got out the records. All in order. Check issued . . . cashed . . . filed. We showed him his signature on the back of the check.

When he said that wasn't his writing, we called in the payroll supervisor, a man who'd been with us for years. Could he explain what had happened?

He couldn't. And he was so distressed by the situation that he collapsed and had to be sent home. We immediately began an investigation.

Our supervisor, we found, had been working a slick scheme. He was the one who had taken the check in question, forged the endorsement and pocketed the money. He'd diverted other checks, too. And for months he'd kept the names of many former employees on the regular payroll, and appropriated their "pay" as the checks were issued.

We determined that he'd stolen $6,323.94 before being tripped up. Fortunately, the entire loss was covered by our Hartford Blanket Fidelity Bond.

Protect *your* firm against the risk of financial loss caused by employee dishonesty. Get a Hartford Blanket Fidelity Bond. It covers all employees alike; there's no reason for any worker to feel that you're pointing a suspicious finger in his direction.

Your Hartford Accident and Indemnity Company Agent or your insurance broker will be glad to give you complete details of this essential protection. Call him—*now*.

Year in and year out you'll do well with the

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Hartford Live Stock Insurance Company
Citizens Insurance Company of New Jersey . . . *Hartford 15, Connecticut*
Northwestern Fire & Marine Insurance Company
Twin City Fire Insurance Company . . . *Minneapolis 2, Minnesota*

Your best

cancer insurance...

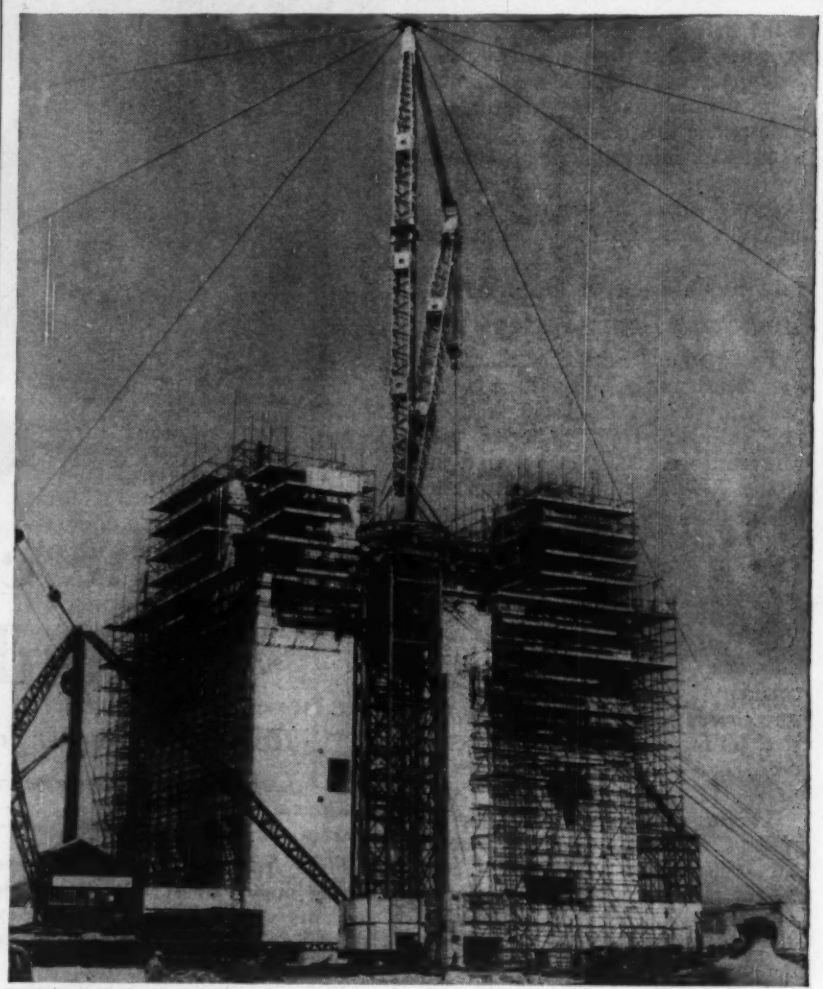
"LIFETIME" POLICY... See your doctor *every year* for a thorough check-up, no matter how well you feel.

"DAY-TO-DAY" POLICY ...See your doctor *immediately* at the first sign of any one of the seven danger signals that *may* mean cancer (1) Any sore that does not heal (2) A lump or thickening in the breast or elsewhere (3) Unusual bleeding or discharge (4) Any change in a wart or mole (5) Persistent indigestion or difficulty in swallowing (6) Persistent hoarseness or cough (7) Any change in normal bowel habits.

Many cancers can be cured, but only if properly treated *before* they have begun to spread or "colonize" in other parts of the body.

For *any* information about cancer just call the American Cancer Society or write to "Cancer" in care of your local Post Office.

American Cancer Society



THERMAL REACTORS, 120 ft high, have very thick, high density concrete walls.

Britain Pushes First Atom Power Plant

Having just announced a ten-year, $840-million program to build 12 atom power plants to meet 25% of the nation's new electricity needs in the near future, Great Britain has jumped well into the lead in atom power. Their first thermal power station using heat generated by atom energy is now in an advanced stage of construction. This plant at Calder Hall, Cumberland, is likely to be the first such station in operation in the world.

There is every reason to believe that this plant will be generating electricity next year (1956). Its capacity is likely to be in excess of 50,000 kilowatts—no official figure has yet been given—part of which will be used by a plutonium factory, the rest of the power being fed into the national grid system.

Two 120-ft high atomic furnaces (reactors, or "piles") will be used at Calder Hall, each working with four steam-raising towers about 80 ft high. Heat which is generated in the graphite-moderated uranium reactors will be carried to the steam plant by carbon dioxide under high pressure; the hot gas giving up its heat to preheating, evaporating and superheating sections of the steam plant. After passing through the steam-raising towers the cooled carbon dioxide gas will be recirculated by powerful blowers back to the reactors where the heating cycle is repeated.

One of the most interesting features from the technical point of view is the use of a double-pressure steam cycle in order to maintain maximum efficiency from the comparatively low temperature (a figure of about 400 deg. C. has been mentioned), as compared with a conventional furnace, of the gas entering the steam towers.

The turbine hall, of conventional power station design, houses four alter-

nator sets of 22,000 KVA capacity each, and the cooling towers of hyperbolic concrete shells, each 300 ft high and 200 ft diameter at the base, are also of normal design. There is a two-story administration block and the ancillary works include roads, drainage, fencing, ducts, etc. Taylor Woodrow, Ltd., is the general contractor; steam producing equipment is produced by Babcock & Wilcox; and the turbo-alternator plant, circulating gas blowers and pipework is being provided by C. & A. Parsons & Co., Ltd., all of London.

Montreal Span To Be Revamped For St. Lawrence Seaway

Canada's most historic bridge is to have a face lifting. The Victoria Bridge, crossing the St. Lawrence River at Montreal (joining the island of Montreal to the mainland to the south), is to be equipped with a second two-lane highway for automobile and bus traffic.

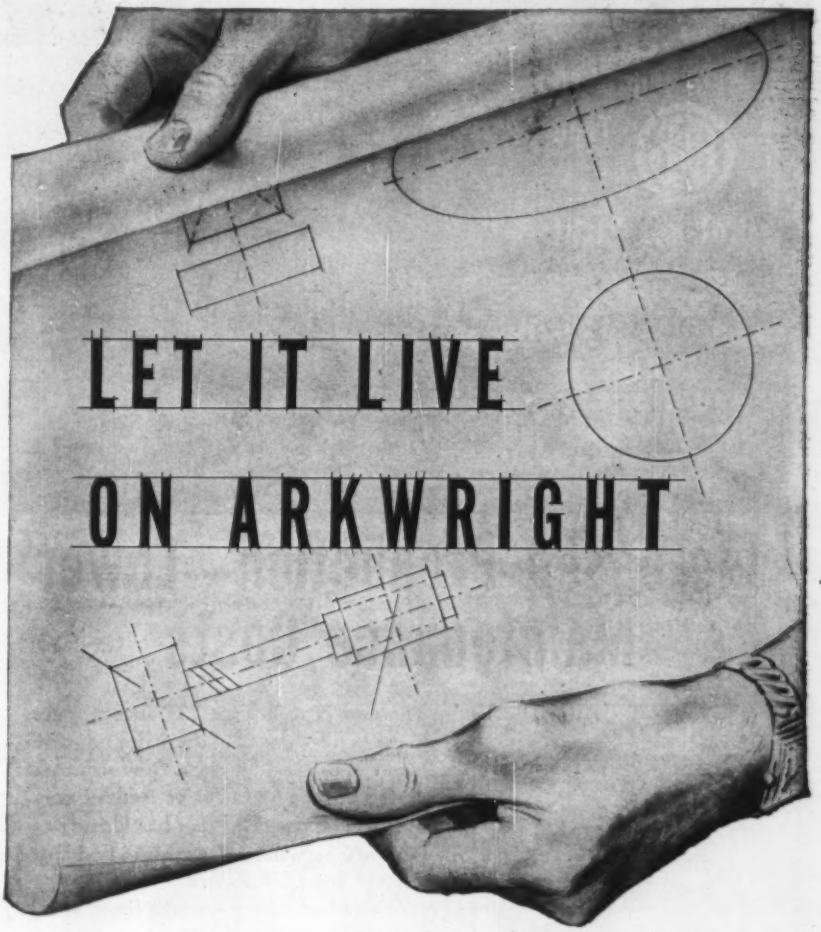
Plans also call for the Canadian National Railways, which now operates four tracks on the bridge, to replace one of the main spans of the bridge with a vertical lift span to cross the downstream end of a projected lock on the Seaway. This lock is scheduled for construction at the Lachine Rapids and will run along the south shore of the St. Lawrence opposite Montreal.

To facilitate auto traffic on the bridge, an ingenious clover-leaf will be constructed to enable automobiles to use an alternative lift span at the upstream end of the lock when the bridge at the downstream end is open.

Plans were announced in Montreal on Jan. 26, following a meeting between officials of the City of Montreal, and the President of Canadian National Railways and the Chairman of the St. Lawrence Seaway Authority. Improvements to the bridge, occasioned by this change and the necessary changes for the passage of the Seaway through the bridge, will cost $6,300,000.

The bridge was originally built in 1860 as a tubular structure. The spans were changed to through steel truss spans in 1901 and a number of minor improvements have been made. But the original piers are still in use.

The bridge now carries two main line tracks and two electrified suburban tracks of the C.N.R. Application has been made for permission to abandon service on the electrified line due to a persistent loss of money and the necessary revamping of the Victoria Bridge in connection with the Seaway.



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Longer life and sharper prints are the results of Arkwright's increased transparency.

"Blobbing" and "Feathering" eliminated. Arkwright's finer finish gives an unequaled working surface, which withstands an endless amount of erasing and still delivers concise, clear lines.

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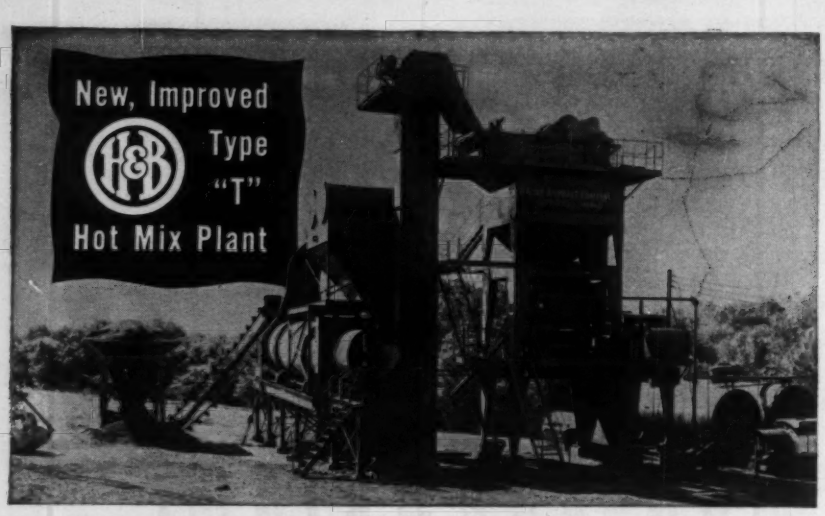

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The new H & B Type "T" incorporates, in the basic plant, all of the major improvements of the past 20 years. New structural design and many exclusive features combine to make a plant that has already established outstanding records in both production and maintenance.

In addition to the features listed at the left, air controls and self-contained overflows are standard equipment on all Type "T" plants. No loose pieces to move or erect. 4 sizes—from 25 tons to 160 tons per hour—to meet your requirements. Available with electric, Diesel electric, Diesel or gasoline power. Factory wired plants available when electric power is used.

For specifications and complete information, write for Bulletin T-54.

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CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
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OBITUARIES

Herman F. Tucker, 77, Seattle consulting engineer and a designing engineer on the Panama Canal project, died Feb. 1. An engineering graduate of Harvard University, he joined government service in 1907 to head locks and valves work on the Canal. Later he assisted in designing Harvard Stadium and helped plan the Boston Elevated Railroad and the Boston Subway. After moving to Seattle in 1915 he became consulting engineer on such projects as the Skagit River hydro-electric development.

Arthur W. Gage, 73, chief structural engineer for Hetherington & Berner, Inc., Indianapolis, died early this month. He received his engineering degree at the University of Maine in 1903 and had worked for the Indianapolis firm for 45 years.

Joel H. Berry, 66, public utilities engineer and district manager of Virginia Electric & Power Co. at Norfolk, Va., died Feb. 5. Berry, who played an important part in directing expansion of Vepco's facilities, began his career in 1913 after receiving degrees at Mississippi College and Georgia Institute of Technology.

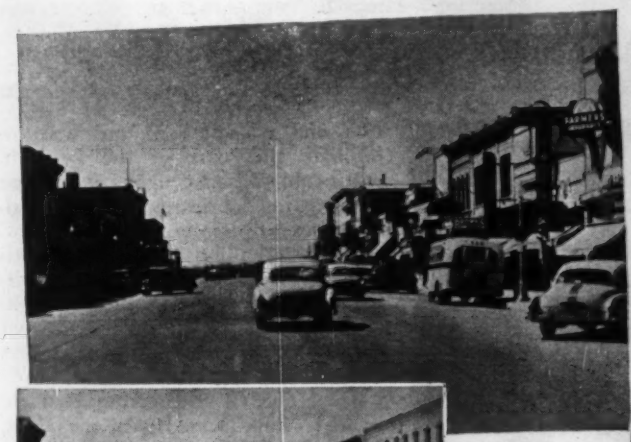
Hal W. Goodman, 55, Akron, Ohio, civil engineer who had served in various city and county engineering departments, died Jan. 31. He recently worked for the Ohio State Highway Department as assistant maintenance engineer.

David B. Thomas, 58, equipment engineer for the North Carolina Highway Department, died Jan. 27. A resident of Greensboro, N. C., he had been with the road department for 33 years.

Calvin F. Thomas, 88, Louisville, Ky., building contractor who erected one of the city's first apartment houses, died Feb. 3. He also was responsible for construction of numerous commercial buildings in Florida and Havana as well as in Louisville.

Frank G. Cantwell, 60, formerly a civil engineer for the Public Service Coordinated Transport, Newark, N. J., died in Elizabeth, N. J., Dec. 9. He retired in 1946.

Alfred W. A. Eden, former civil engineer for the American Cyanamid Co. of New York, died Dec. 13 in Montclair, N. J. He was a resident of East Orange, N. J.



40 YEARS OLD
Main St., Longmont. Paved 1915. Photos were taken in 1924 and 1953.

39 YEARS OLD
College Ave., Fort Collins. Paved in 1916. Photos taken 1921, 1953.

HERE TODAY *and still here tomorrow*

that's the story of Colorado's CONCRETE STREETS

If you were a visitor to the "Centennial State" a generation ago, you probably appreciated some of the fine new concrete streets shown here. And if you revisited Colorado today, you'd find many of these same concrete streets are still on the job—proof of concrete's durability and economy.

Long service such as this—at low annual cost—is typical of the record of concrete streets in every state in the Union. And today, because of improvements in engineering design, materials and construction methods, concrete pavements can be built to last at least 50 years!

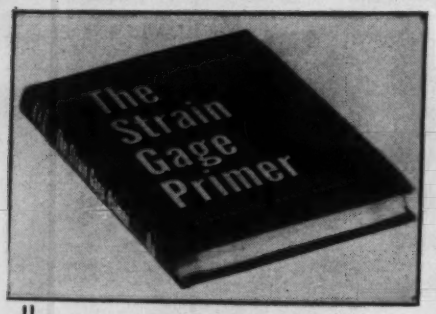
Concrete streets are not only economical and durable but also much safer. Their gritty, highly skid-resistant surface permits quicker, safer stops, wet or dry. Their light color, which reflects up to four times more light than dark pavements, not only reduces street lighting costs but enables drivers to see farther and better, too. Remember, *when you can see better you are much safer!*

For more information about durable, safe, ***low-annual-cost*** concrete streets, write for free literature, distributed only in U.S. and Canada.

PORTLAND CEMENT ASSOCIATION
A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work
Dept. A2d-17, 33 West Grand Avenue, Chicago 10, Illinois

35 YEARS OLD
Main St., Brighton. Paved in 1920. Photos were taken in 1924 and 1953.

31 YEARS OLD
Main Street in Fort Lupton, paved in 1924. Photos taken in 1924 and 1953.



THE STRAIN GAGE PRIMER

Just Published!

A practical guide to best methods of using strain gages for accurate results. Covers all areas of the subject, from picking the right gage for a particular job, through cementing and damage-proofing, and interpreting the strain data in terms of important stresses. Includes worked-out examples of stress-strain relation, techniques for measuring principle stresses directly, data on latest American and foreign strain gages and their properties, etc. **By C. C. Perry and H. R. Lissner, 304 pp., 180 illus., $6.00**

THE TESTING AND INSPECTION OF ENGINEERING MATERIALS

Just Published—Second Edition!

A practical approach to the principles and methods of materials testing, with full details on types of tests in current use. Describes modern testing equipment and covers effects of variables on test results. **2nd Edition** includes information on micro-hardness testers, non-destructive tests, low temperature impact tests, and true stress-natural strain relations. **By H. E. Davis, G. E. Troxell, Profs. of Civil Engrng., U. of Calif., and C. T. Wiskocil, former Prof. of Engrng., U. of Calif. 480 pp., 172 illus., $8.50**

APPLIED ENGINEERING MECHANICS

Shows how to solve practical engineering problems in statics and dynamics—with scores of examples and worked-out problems. Covers 138 engineering topics, including coplanar, parallel force systems; friction; moments of inertia or areas; curvilinear motion; kinetics of rotation; impulse and momentum; and many others. **By Alfred Jensen, Professor of Architectural Engineering, Univ. of Washington. 316 pp., 478 illus., $4.00**

PRESTRESSED CONCRETE STRUCTURES

A wealth of design data on prestressed concrete—with pointers on when and where to use it. Discusses steel and concrete, their types, and behavior when combined into prestressed members. Shows every step in prestressed concrete design—the problem itself, reckoning dead and live load, working all equations. Many detailed examples show how prestressed concrete was used in actual structures. **By August E. Komendant, Consulting Engineer. 261 pp., 153 illus., $6.00**

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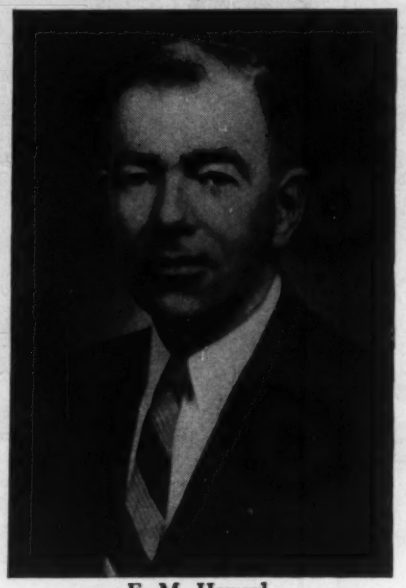
MEN AND JOBS



E. M. Howard

Wire Reinforcement Group Appoints Field Engineer

Edward M. Howard, former Asphalt Institute district engineer, has been appointed field engineer of the Wire Reinforcement Institute, Washington, D. C.

With headquarters in Springfield, Ill., Howard will be concerned primarily with fabric-in-asphalt promotion and consultation, and will coordinate the work of the Institute with state and city engineers who are constructing fabric reinforced asphaltic concrete projects.

Prior to joining the Asphalt Institute in 1946, Howard was a consulting engineer in the street and highway field and was formerly associated with the Illinois Division of Highways as a resident engineer.

He is a civil engineering graduate of M.I.T. and served with the U. S. Navy as an officer in the Seebees during World War II.

Air Pollution Studies Directed by A. C. Stern

Arthur C. Stern, chief industrial hygiene engineer of the New York State Department of Labor, has been named to direct air pollution studies for the Public Health Service. His headquarters will be at the Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio, where several studies of community air pollution problems are already underway.

Stern is a mechanical engineering graduate of Stevens Institute of Technology and has lectured and written extensively on air pollution, ordinance development and related subjects.

New York University Honors William J. Heiser

William J. Heiser, president of Lockwood Greene Engineers, was awarded the New York University College of Engineering Centennial Award "for professional achievements and services to the common good". The award was presented by Dean Thorndike Saville during the college's midwinter centennial convocation. Heiser is a 1909 civil engineering graduate of the college that honored him. He joined Lockwood Greene Engineers, Inc. in 1926.

Men and Jobs Briefs . . .

• **Corps of Engineers**—Next week, **Col. John L. Wilson, Jr.**, takes over as district engineer at Rock Island, Ill., succeeding **Col. Nelson Leclair, Jr.**, who will join Iowa-Illinois Gas & Electric Co. after his retirement . . . **Lt. Col. James E. Hammer** is appointed assistant district engineer for the Buffalo, N. Y. district . . . **Col. Jack L. Coan** is executive officer of the Missouri River division office (ENR, Feb. 10, p. 71)—he replaces **Col. Philip Y. Browning**, assigned to the Far East . . . All corps of engineer functions in Texas coastal areas are being placed under the Galveston district.

• **Careers**—New chief engineer of the Harbors and Rivers Branch of the Dept. of Public Works in Canada is **Jean Paul Carriere**—he succeeds **Alexander A. Anderson**, retiring after 44 years of service . . . **John A. Volpe**, head of John A. Volpe Construction Co., Malden, Mass., is appointed Commissioner of Public Works for Massachusetts . . . **Curtis A. Nelson** heads up AEC's Inspection Division—his responsibility is compliance by contractors and others with AEC.

• **Associations**—Ohio Concrete Block Assn. names **Sam C. Davis**, Dayton, president . . . **H. B. Brown** is reelected president of Metal Lath Manufacturers Assn. . . . RCA's **M. S. Gokhale** is new president of The Standards Engineers Society . . . **J. E. McCracken** of Bethlehem Steel Co. heads up ARBA's executive committee on Materials and Supplies . . . **Brother Benjamin Austin**, Manhattan College civil engineering professor, becomes president of the New York City section of the American Society of Photogrammetry.

• **Business**—George E. Failing Co., equipment manufacturers in Enid, Okla., names **Paul Courtney** president and director . . . **P. E. MacAllister** becomes president of MacAllister Machinery Co., construction equipment distributors in Indianapolis . . . **Alfred E. Busch** heads up Keuffel & Esser Co.'s new hardware division in Cape May Court House, N. J. . . . **Clayton L. Davis** is appointed technical service director, Universal Atlas Cement Co.

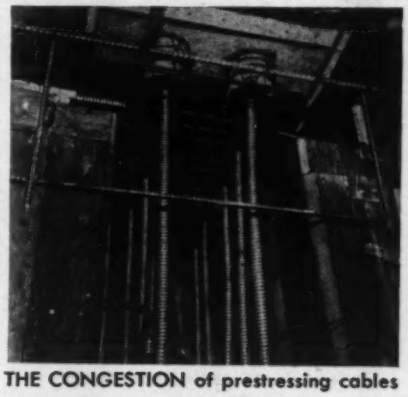
• **Education**—General Electric's **Karl B. McEachron, Jr.** is appointed dean of Case Institute of Technology's undergraduate school . . . **Capt. Wiliam A. Hickey**, USN (Ret.), is named dean of Detroit Institute of Technology.

(Advertisement)

VIBER VIBRATOR selected for concrete compaction in crucial area to produce maximum density at the point where concrete stress is critical.

Vibration essential in crucial area around prestressing cones

THE RICHFIELD OIL BUILDING ANNEX in Los Angeles is the largest monolithic prestressed concrete office building in the United States today. According to Albert C. Martin and Associates, architects and engineers on this project, prestressed construction was adopted because of design problems resulting from the matching of 10 foot 3 inch floor to floor heights in the existing building. With 8 feet the minimum clearance height, prestressing not only made possible the matching of the high velocity air conditioning ducts, and at the same time installation of recessed lighting, but allowed a 46 foot clear span for flexibility in partitioning of office space. Because of the lack of room for erection equipment the new structure was cast in place.



THE CONGESTION of prestressing cables and cones at the point of maximum load requires top performance from vibration equipment.

• **Concentration of load** on the cable anchorage by stressed cables makes the area around the cones the most crucial area. Because patching of concrete in this area of cast-in-place prestressed concrete could scarcely be tolerated, consolidation of the concrete in this area is particularly important.

• **Guy F. Atkinson Company**, contractor, used Viber 1-5/16 and 1-3/4 inch diameter vibrators. Model E electric motor driven vibrator 1-3/4 inch diameter was used at the base of cone, or where spacing would allow, the 1-5/16 inch diameter Model 26 was used between cones as well as at the base of cone.

For further information on Viber's complete line of internal and external vibrators, contact your authorized distributor or Viber Company, Dept. 67, 726 South Flower Street, Burbank, California.

VIBER

CONCRETE VIBRATORS SINCE 1931

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

▲ **MASSACHUSETTS**—BA 3/8—Massachusetts Turnpike Auth., 80 Boylston St., Boston,
Brimfield and Warren—Contr. 51-053 hy. and bridge constr. $2,500,000. Plans deposit $60. Charles T. Main, Inc., 80 Federal St., Boston, section engr. Howard, Needles, Tammen & Bergendoff, 80 Boylston St., Boston, engrs. CD 8/11.

▲ **MASSACHUSETTS**—BA 3/10—Massachusetts Turnpike Auth., 80 Boylston St., Boston,
Framingham, Natick and Wayland—Contr. 15—92 hy. and bridge constr. $3,500,000. Plans deposit $100. Howard, Needles, Tammen & Bergendoff, 80 Boylston St., Boston, engrs. CD 8/11.

BIDS ASKED—BUILDINGS

Mass., Boston—SCHOOL—BA 3/2—City, Dpt. School Bldgs., 26 Norman St., Curtis Guild School addn., Assembly Hall, East Boston. $936,000. Plans deposit $100, refundable. Campbell & Aldrcih, 38 Newbury St., archts. CD 11/15.

▲ **Mass., Boston**—SCHOOL—BA 3/3—City, Dpt. School Bldgs., 26 Norman St., elementary school, William E. Russell District, Mt. Vernon St., Dorchester. $1,313,000. Plans deposit $100, refundable. Thomas F. McDonough, 25 Huntington Ave., archt. CD 4/27.

▲ **Mass., Hyannis**—SCHOOL—BA 3/18—Town of Barnstable, Melvin C. Knight, supt. Schools, 387 Main St., Hyannis, high school, West Main St. $2,175,000. Plans deposit $50, refundable. Walter M. Gaffney, W. Main St., archt. CD 5/28.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Seaboard Engineering Co., Inc., 65 Commercial St., Portland, Me. LB $749,031, est. $800,000. dam, F.A. Proj. F 045-1 (1), S.P. 2658, Perry and Eastport, MAINE. State Hy. Comn., State House, Augusta, Me. Bids Feb. 9. CD 1/24.

† **B. Perini & Sons**, 73 Montwait Ave., Framingham, Mass. LB $486,950, est. $500,000. processing and stockpiling sand and gravel aggregates Loring Air Force Base, ENG-19-016-55-80, LIMESTONE, ME. U. S. Eng., 857 Commonwealth Ave., Boston, Mass.

MASSACHUSETTS—Commonwealth of Mass., Metropolitan Dist. Comn., Parks Div., 20 Somerset St., Boston,
F. E. Daddario Corp., 73 Tremont St., Boston, Mass. CA $599,657, est. $600,000. Prop. 881 wid'n. Dorchester Bay Bridge, Dorchester. CD 2/9, under LB.

▲ **RHODE ISLAND**—State R. I. & Providence Plantations, F. A. Adams, purch. agt., State House, Providence,
M. A. Gammino Constr. Co., 728 Valley St., Providence, R. I., LB $2,579,136, est. $2,500,000. rein.-con. pavement Interstate Hy. Nooseneck Hill Rd. relocation to Conn. State Line. No. 638 RI Constr. 5-505 FAP FI-01-(6), Richmond and Hopkinton. Bids Feb. 9. CD 2/1.

BUILDINGS

LOW BIDS AND CONTRACTS

J. F. Rand & Son, 57 Sudbury St., Boston, Mass. CA Approx. $500,000. FACTORY, Hammond St., BANGOR, ME. Old Town Shoe Co., 449 N. Main St., Old Town, Me. Bids Feb. 3. CD 1/25.
Michael John Realty Trust, Pemberton Square, Boston, Mass. Owner Builds. $400,000. 35 RESIDENCES, LOWELL, MASS. Lester N. Lechter, 739 Boylston St., Boston, designer.
▲ **Bilt-Rite Constr. Co.**, 138 Conant St., Beverly, Mass. Separate Contracts. $2,000,000. one hundred and fifty 1 story, bsmnt., RESIDENCES, Lowell and Cross Sts., PEABODY, MASS.
▲ **C. Sullivan Co., Inc.**, 594 Thames St., Newport, R. I. CA $2,560,000, est. $2,200,000. Rogers HIGH SCHOOL, off Ruggles Ave., NEWPORT, R. I. City, Supt. Schools, City Hall, Newport, R. I. Bids Feb. 2. CD 2/7, under LB.
▲ **Sturgess-Buza-Jochmus Co.**, c/o Charles T. Sturgess, 85 Whitney Ave., New Haven, Conn. Owner Builds. $2,500,000, 160 RESIDENCES, Blackstone Property, BRANFORD, CONN. CD 9/28.
▲ **Leo McManus Constr. Co.**, Inc., West St., Danbury, Conn., CA, $3,000,000. THEATRE, STRATFORD, CONN. American Shakespearean Festival Academy, c/o Mrs. Alexander Chaten, Tomney Rd., Greenwich, Conn. (Excavation contract to Lind McLeod, 1780 Stratford Ave., Stratford, Conn.)

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

▲† **Pa., Phila.**—ELECTRICAL DISTR. SYS.—BA On Or About 3/11—U. S. Eng., P. O. Box 8629, Zone 1, expansion and imprv. electrical distr. sys. at Frankford Arsenal, Bridge and Tacony Sts. $1,000,000.

▲ **New York**—BA 4/18—Power Authority of The State of New York, 270 Broadway, New York, Zone 27, Barnhart Island Power Plant. Extended date. CD 2/14.

BIDS ASKED—BUILDINGS

▲ **N. Y., New York**—HOSPITAL—BA 3/11—Dept. P. Wks., Municipal Bldg., Zone 7, Constr. 1, general constr.; Contr. 2, plumbing; Contr. 3, heating and ventilating; Contr. 4, electrical work for constr. General Care Hospital Bldg. and reconstr. in existing bldgs., at Harlem Hospital, Manhattan Boro. $7,000,000. Plant deposit $100. Ferrenz & Taylor, 152 W. 42 St., Zone 36, archts. Edwards & Hjorth, 67 W. 44th St., Zone 36, structural engrs. Jaros, Baum & Bolles, 415 Lexington Ave., Zone 17, mech. engrs. CD 12/9.
▲ **N. Y., Brooklyn**—PALLETIZING, etc.—BA 3/14—Joseph Schlitz Brewing Co., c/o Kahn & Jacobs, archts., 2 Park Ave., New York, Zone 16, 2-story palletizing bldg. and beer storage, 105-19 Evergreen Ave. $1,500,000. CD 12/20.
▲ **N. Y., Middletown**—STOREHOUSE, etc.—BA 3/31—Henry A. Cohen, dir. Bureau Contracts & Accounts, Dpt. P. Wks., The Governor Alfred E. Smith State Office Bldg., Albany, constr., heating, sanitary, electric, refrigeration and electric elevator work for storehouse and cold storage bldg., Middletown State Homeopathic Hospital. Plans deposit $40 constr., $15 each, heating, sanitary, elec., $20 refrigeration, $5 elevator. CD 7/9/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **John A. Roebling's Sons Corp.**, 640 S. Broad St., Trenton, N. J., CA $2,198,169, replacing cable bands and bridge suspenders to Manhattan Bridge, NEW YORK and BROOKLYN, N. Y. Dpt. P. Wks. Municipal Bldg., New York 7, N. Y.

Daniel F. MacNamee & Co., Inc., 271 North Ave., New Rochelle, N. Y., CA $739,264, approx. 2.2 mi. roads, incl. approx. 340,000 cu. yd. excav. and embankment; 2,200 cu. yd. concrete, 60,000 sq. yd. rip rap, permanent type asph, macad, pavements, culverts and guard railing in Lake deForest Reservoir area, SPRING VALLEY, N. Y. Spring Valley Water Works & Supply Co., Spring Valley, N. Y. Bids Jan. 7. CD 1/17, under LB.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily
For additional reports see Construction Daily.

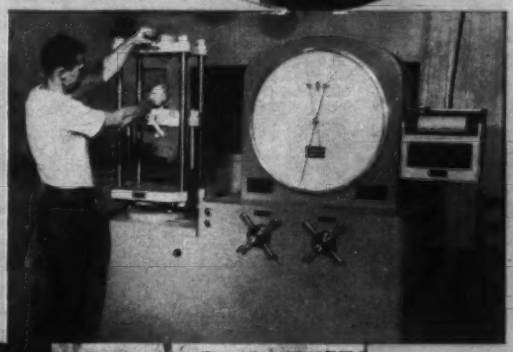
BUILDINGS

LOW BIDS AND CONTRACTS

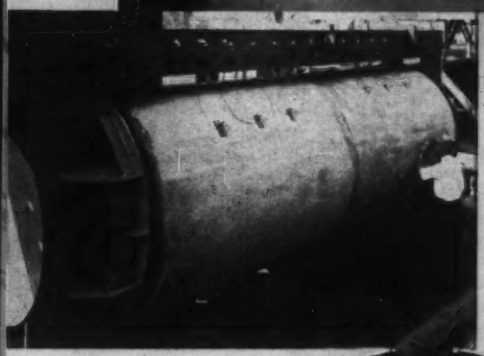
12th Construction Corp., c/o Max Ungarleider, archt., 66 Court St., Brooklyn 2, N. Y. Owner Builds. $850,000. 6 story APARTMENT, Sea Breeze Ave. and Ocean Parkway, BROOKLYN, N. Y.
Vicbar Constr. Corp., 17 Neptune Ave., Brooklyn 29, N. Y. Owner Builds. $390,000. 26 HOUSES, tract at E. 98 St. and Avenue L, BROOKLYN, N. Y. Morris Rothstein & Son, 186 Joralemon St., Brooklyn 2, N. Y., archts.
▲ **Mar-Mes Constr. Co., Inc.**, 271 North Ave., New Rochelle, N.Y., CA $1,734,200, Ellenville Central SCHOOL, ELLENVILLE, N. Y. Central School Dist. No. 2, Bd. Educ., Maple Ave., Ellenville, N. Y. Bids Jan. 5. CD 1/10 under LB.
Juniper Terrace, Inc., c/o Max Rosenfeld, archt., 89-31 161 St., Jamaica, N. Y. Owner Builds. $540,000. 54 HOUSES in area bounded by 75 Pl., Eliot Ave. and Juniper Blvd., ELMHURST, N. Y.
▲ **Silberstein & Ornstein**, c/o Herman York, archt., 90-04, 161 St., Jamaica, N. Y. Owner Builds. $2,250,000. 98 HOUSES, 32-acre tract Radcliff Dr. and Tanyard Lane, HUNTINGTON, N. Y.
▲ **Laurence J. Rice, Inc.**, 61-40 Maurice Ave., Maspeth, N. Y. CA $1,365,000. SCHOOL, GYMNASIUM and BROTHERS RESIDENCE in area bounded by 31 Ave., 71 St., 32 Ave. and 73 St., JACKSON HEIGHTS, N. Y. Brothers of The Sacred Heart, c/o John M. Bell, archt., 261 Broadway, New York 7, N. Y. CD 11/12.
▲ **Richmond Estate Homes**, c/o Nassau Homes Realty Corp., 1 North Merrick Ave., Merrick, N. Y. Owner Builds. $1,600,000. 79 HOUSES, Richmond Rd. and North Jerusalem Ave. NORTH MERRICK, N. Y.
▲ **Louis Lipman & Bernard Spitzer**, c/o Wechsler & Schimenti, archts., 52 W. 46 St., New York 19, N. Y. Owner Builds. $1,000,000. 12 story APARTMENT, Grand Concourse from 204 to 205 Sts., NEW YORK, N. Y.
▲ **Woodbury Hills Homes**, c/o Alwin Cassens, Jr., archt., 145 S. Franklin Ave., Valley, Stream, N. Y. Owner Builds. $6,400,000. 400 HOUSES, Woodbury Rd., east of South Oyster Bay Rd., SYOSSET HILLS, N. Y.
▲ **Irving Zaretsky & Lawrence M. Rothman**, c/o Lawrence M. Rothman, archt., 147 E. 125 St., New York, N. Y. Owner Builds. $1,300,000. 6 story APARTMENT, Broadway and Lake St., WHITE PLAINS, N. Y.
Gussey & Poposini, 5539 Walnut St., Pittsburgh 32, Pa., LB $114,750, Schedule A, Site PI-02-C; LB $117,680, Schedule B, Site PI-25-C;
Brownsville Constr. Co., Brownsville, Pa., LB $113,685. Schedule C, Site PI-42-C; LB $119,064, Schedule D, Site PI-52-C;
G. P. Fleetwood & Co., Inc., Box 11002, Pittsburgh 37, Pa., LB $92,590, Schedule F, Site PI-71-C; LB $92,410, Schedule G, Site PI-92-C;
Fairchance Lumber Co., Fairchance, Pa., LB $115,100, Schedule E, Site PI-62-C; LB $811,160, Schedule H, combined bid, incl. all sites various locations, for ENLISTED MENS BARRACKS, OFFICERS QUARTERS, ADMIN., RECREATION and STORAGE BLDGS., Control Areas, Special AAA Sites, Serial ENG-18-020-55-33, PENNSYLVANIA. U. S. Eng., P. O. Box 1715, Baltimore 3, Md.
▲ **Jos. F. Hughes & Co.**, 5 E. Franklin St., Baltimore 2, Md. CA $2,283,187. Southern Junior-Senior HIGH SCHOOL alterations, BALTIMORE, MD. City, Bureau Bldg. Constr., 410 Municipal Bldg., Baltimore 2, Md. CD 2/4, under LB.
▲ **James Keelty Co.**, 4200 Edmondson Ave., Baltimore 29, Md. Owner Builds. $1,760,000. 176 brick DWELLINGS, Old Trail Heathfield Rds., Rodgers Court, Dumbarton Rd., Rodgers Rd.; $366,000. 28 brick DWELLINGS, on 7000 block Yord Rd. and 400 block Stevenson Lane, BALTIMORE, MD.
Morton Macht, 11 E. Fayette St., Baltimore 2, Md. Owner Builds. $426,500. fifty-nine 2 story brick row type HOUSES, 4600 block Parkside Dr. and 4600 block Shamrock Ave., BALTIMORE, MD.
Jack Meyerhoff, 14 W. Saratoga St., Baltimore, Md. Owner Builds. $476,000. 53 row type DWELLINGS, 611 block Dunromaing Rd., BALTIMORE, MD.
Ralph W. Simmers Building Co., 6313 Kenwood Ave., Baltimore 6, Md. Owner Builds. Est. $388,000. 37 brick row type DWELLINGS, Weyburn Rd., Kenwood Development, northeast of BALTIMORE, MD.
Dundalk Building Co., 10 E. Fayette St., Baltimore 2, Md. Owner Builds. $644,800. ninety-three 2 story, brick masonry HOUSES, Kirkleigh Ave., Denbury Dr., Holborn Dr., Ormond Rd., Stanbrook Development, near DUNDALK, MD.
J. Irving Ensor, Jr., 29 Oakway, Timonium, Md. Owner Builds. $384,000. 24 brick DWELLINGS, Gorsuch Rd., Yorkshire Development, near TIMONIUM, MD.
Gilbert Constr. Co., York Rd., Timonium, Md. Owner Builds. $407,000. 37 frame DWELLINGS, Green Meadow Dr., Haveford Development, near TIMONIUM, MD.

(Cotinnued on page 66)

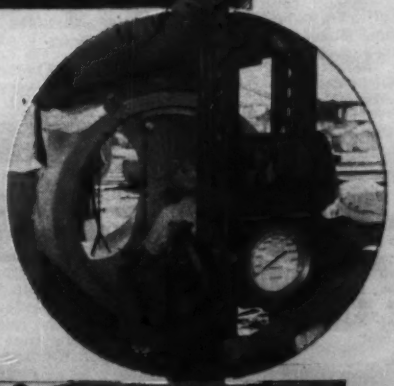
Standard 6"x 12" test cylinders are made from the same batch of concrete as the pipe, cured with the pipe in the same steam box and are subjected to compression tests.



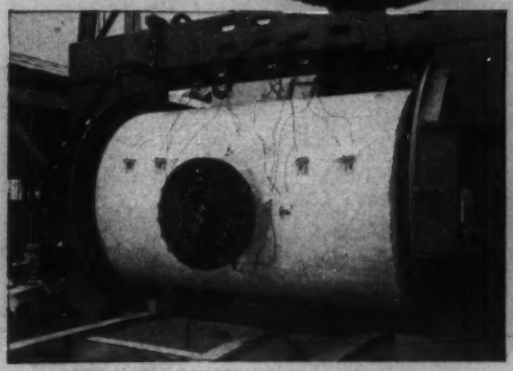
Steel reinforcement rods are tested to determine their physical properties. Stress-strain diagram may be plotted on recorder at right.



Completed pipe sections receiving hydrostatic test. Water pressure is increased until ultimate failure of the pipe section; research engineer makes periodic examinations as pressure goes up.



Resistance to external loadings is determined by careful checking as pipe receives three-edge bearing test.



Strain gauges give accurate record of behavior of pipe components under hydrostatic test.

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Concrete pipe for main water supply lines, storm and sanitary sewers, subaqueous pipe lines

(Continued from page 64)

Sherwood Manor, Inc., 4231 Greenmount Ave., Baltimore 12, Md. Owner Builds. $417,000. 30 masonry DWELLINGS, Yataruba Dr. north of Croyden Rd., north of TOWSON, MD.

SOUTH

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **WEST VIRGINIA**—State Road Comn., 1800 Washington St. E., Charleston,

R. N. Hewitt Corp., 703½ Penn Ave., Charleston, W. Va., CA, $506,794, c. conc. 1.06 mi. U. S. 60, Fed. Aid Proj. F-174 (8), Cabell Co; CA $459,132, c. conc. 1.143 mi. Kenova relocations (US 60), Fed. Aid Proj. F-186 (6) Wayne Co.;

Harman Brothers, Grafton, W. Va., CA $388,736 grading, drainage, bridges 4.49 mi. Osage-Penna Line Rd., Fed. Aid Proj. F-313 (10) Monongalia Co. Bids Feb. 8. Grand total $1,354,662. CD 2/1.

SOUTH CAROLINA—Hilton Head Toll Bridge Authority, John M. Sturgeon, chn., Bluffton,

Wannamaker & Wells, Inc., Orangeburg, S. C., CA $845,554, double span bridge for constr. of toll bridge from Hilton Head Island to the South Carolina mainland, Beaufort Co. Bids Dec. 21. CD 12/23, under LB.

† **Valley Constr. Co.**, P. O. Box 787, Columbus, Ga. CA $102,296. rein.-con. jet engine test cell fdn. with concrete apron around it, 1 story addn. to cold storage plant, access road, driveway and walk, Greenville Air Force Base, GREENVILLE, MISS. U. S. Eng., 2301 Grant St., Mobile, Ala.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **English Constr. Co.**, Main St., Alta Vista, Va., CA $1,001,801, two HIGH SCHOOLS (one) Rte. 29, (other) Rte. 60, near AMHERST, VA. Amherst County School Bd., Tyler Fulcher, supt., Amherst, Va. Bids Jan. 29. CD 2/4, under LB.

▲ **Edward R. Carr, Inc.**, 1010 Vermont Ave. N. W., Wash. D. C. Owner Builds. $16,800,000. 1,200 HOMES, 500-acre tract south of Braddock Rd., Annandale, FAIRFAX, VA. Harry Ormston, McLean, Va., archt.

▲ **M. T. Broyhill & Sons Corp.**, 4624 Lee Hy., Arlington, Va. Own Forces. $2,400,000. 160 brick detached HOMES, Broyhill Park, Annandale; $5,250,000, 350 brick detached HOMES, Lincolnia Area, FAIRFAX, VA.

▲ **English Constr. Co.**, Main St., Alta Vista, Va., CA $1,062,481, KRISE MEMORIAL BLDG. and alterations, addns. to ADMINISTRATION BLDG. and HEATING PLANT, at hospital, LYNCHBURG, VA. Virginia Baptist Hospital, Lynchburg, Va. Bids Dec. 6. CD 12/13, under LB.

▲ **Thompson & Street Co.**, 47 Trinity Ave. S.W., Atlanta, Ga., CA, $2,191,700. No. 2 CAPITOL SQUARE BUILDING addns., ATLANTA, GA. State Office Bldg. Auth., State Capitol, Atlanta, Ga. CD 3/24/53.

▲ **Beers Constr. Co.**, 70 Ellis St. N.E., Atlanta, Ga., CA, $2,500,000, Piedmont HOSPITAL, 1968 Peachtree Rd. N.W., ATLANTA, GA. Piedmont Hospital, Inc., 70 Ellis St. N.E., Atlanta, Ga. Armistead & Saggus, 739 W. Peachtree St., Atlanta, Ga., and Philip T. Shutze, Candler Bldg., Atlanta, Ga., archts.

F. Miller & Sons, Box 921, Lake Charles, La. CA $763,350. fourteen 120x200 ft. steel BUILDINGS, incl. grading, soil compaction, drainage and concrete foundations, LAKE CHARLES, LA. Lake Charles Harbor & Terminal District, 424 Pujo St., Lake Charles, La. Awarded Feb. 9. CD 2/9, under LB.

▲ **Blue Ribbon Constr. Co.**, 3333 Palm Ave., Hialeah, Fla., CA $2,600,000, 400 RESIDENCES, "Sierra Mirada" N.E. 2nd Ave. and NW. 198 St., MIAMI, FLA. E. J. Pollock Corp., 333 Palm Ave., Hialeah, Fla.

MIDDLE WEST

SOON LETS CONTRACT—BUILDINGS

Ill., Geneva—HOSPITAL—Community Hospital, 416 2nd Ave., soon lets contract hospital addn. $500,000. Frazier & Raferty, 315 James St., archts. CD 12/9/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **H. W. Miller Constr. Co.**, 1511 Neave St., Covington, Ky., CA $1,662,128, power and service bldg. for Mill Creek Sewage Works, CINCINNATI, O. City, City Hall, Cincinnati, O. Bids Feb. 1. CD 2/11, under LB.

The Fishel Co., 1170 Kinnear Rd., Columbus, O., CA $800,413, Morse Road water transmission mains to convey water from new filtration plant on Big Walnut Creek to the distr. sys. of City of Columbus, COLUMBUS, O. City, Director P. Service, City Hall, 90 W. Broad St., Columbus, O. Bids Feb. 1. CD 2/11, under LB.

▲ **E. A. Bock Constr. Co. Inc. & E. R. Knapp & Son Constr. Co.**, P.O. Box 836, Fort Wayne 1, Ind., CA $1,412,833, Sect. A intercepting sewers, DEFIANCE, O. City, Defiance, O. Bids Jan. 11, awarded Jan. 25. (Correction—contractor). CD 1/25, under LB.

John Erskine Co., 9259 N. Laramie Ave., Skokie, Ill., LB, $106,754, sanitary sewers;

Anthony Giancola, 4012 W. Taylor St., Chicago, Ill., LB $154,459, sewage plant, HAMPSHIRE, ILL. Village, Village Hall, Hampshire, Ill. Bide Feb. 3. CD 1/24.

▲ **The Greenfield Constr. Co.**, 16596 Greenfield St., Detroit 35, Mich. CA $1,183,970. concrete cylinder pipe water mains 16- to 36-in.;

George Tripp, Inc., Pontiac, Mich. CA $476,306. concrete cylinder pipe lines 16 and 24 in.;

Telegraph Constr. Co., Lathrop, Mich. CA $171,000. constr. three sections 16 in. concrete cylinder water mains in 10 Mile, 11 Mile and 12 Mile Rds., between Southfield and Greenfield Rrs., PLEASANT RIDGE, MICH. South Oakland County Water Auth., 23646 Woodward St., Pleasant Ridge, Mich. Bids Jan. 19. CD 12/16.

Cooke Contg. Co., 1116 Penobscot Bldg., Detroit 26, Mich. CA Est. $101,000. 26,834 sq. yd. c. conc. paving and integral curbing, 6,648 sq. yd. 6 and 8 in. c. conc. paving, 3,195 cu. yd. excav., ST. CLAIR SHORES, MICH. City, D. J. Harm, clk., 24800 Jefferson Ave., St. Clair Shores, Mich. Claude Postiff, 1036 Majestic Bldg., Detroit, Mich., engr. Bids Dec. 22.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Eastgate Homes, Inc.**, 541 Washington St., Gary, Ind., Owner Builds, $2,000,000. 180 HOMES, Maryland, Missouri and Grand Aves., GARY, IND. Rubrich-Fabian Assocs., 5451 Hohman St., Hammond, Ind., archts.

Hellrung Constr. Co., 101 Cherry St., Alton, Ill., CA $750,958 est. $600,000, general contract 2 story 87 x 422 ft., with 93 x 102 ft., 70 x 113 ft., 63 x 137 ft., brick, steel, concrete, masonry block East Junior HIGH SCHOOL, ALTON, ILL. Alton Community School Dist. No. 11, Bd. Educ., Haskell house, 2111 Henry St., Alton, Ill. Bids Jan. 26. CD 2/7, under LB.

Grayco Constr. Co., 1243 S. Wabash St., Chicago, Ill. CA, $750,000, St. Patrick's HIGH SCHOOL and GYMNASIUM, KANKAKEE, Ill. Catholic Bishop of Joliet, 4 E. Clinton St., Joliet, Ill. Awarded Feb. 7. CD 2/9, under LB.

J. P. Cullen & Son, 330 E. Eastern Ave., Janesville, Wis., LB, $857,877, general contract COURT HOUSE and OFFICE, JANESVILLE, WIS., Rock Co., Court House, Janesville, Wis. Bids Jan. 9. CD 1/18.

Cream City Constr. Co., 54 N. 27 St., Milwaukee, Wis., CA, $850,000. 1 story, 240x1034 ft., concrete, steel, brick, block WAREHOUSE, MILWAUKEE, WIS. Mill Road Development Co. c/o contractor. A. P. Rugg, engr. and R. J. Jacobs, archt., 3344 N. 39 St., Milwaukee, Wis.

LOW BIDS AND CONTRACTS

Hunzinger Constr. Co., 4577 N 124 St., Milwaukee 16 Wis., CA, $220,000, 3rd story, 60 x 119 ft. FACTORY addn., MILWAUKEE, WIS. Moebins Printing Co., 300 N. Jefferson St., Milwaukee 2, Wis. Grassold-Johnson & Assocs., 734 N. Jefferson St., Milwaukee 2, Wis., archts.

Louis Home Builders Co., 18035 James Couzens St., Detroit, Mich. CA Est. $950,000. Beech Villa Subdivision No. 3., 50 brick HOMES, REDFORD, MICH. Gordon Williamson Co., (agent), 19170 Grand River St., Detroit, Mich.

WEST OF MISSISSIPPI

BIDS ASKED—BUILDINGS

Kan., Atchison—CHURCH—BA 3/1—St. Benedict College, Atchison, abbey church, $750,000, Barry Byrne, 627 Darthmouth Pl., Evanston, Ill., archt. CD 1/2/45.

Tex., Corsicana—BANK, etc—BA 3/30—First National Bank, Corsicana, 4 story brick, tile, steel, concrete bank and office, air-conditioned. $600,000. Plans doposite $25. Preston M. Geren, 1707 Fort Worth Natl. Bldg., Fort Worth, archt. CD 6/1.

▲ **Texas**—GAS PLANT, etc.—Bids Asked—Texas Natural Gasoline Corp., Box 1409, Tulsa, Okla., gas compressor plant unit, $750,000; natural gasoline plant unit, $2,275,000; gas field pipe line gathering sys. $90,000, between Robert Lee and Silver, Coke Co. CD 12/10.

SOON LETS CONTRACT—BUILDINGS

Mo., Webster Groves (St. Louis 19 P.O.)—CHURCH—Webster Hills Methodist Church, Robert G. Sousley, chn. Constr. Comn., 710 S. Rock Hill Rd., Zone 19, soon lets contract 2 story, ground floor, 153x45x63 ft. church, Lockwood Ave. and Lockwood St., $350,000, Gale E. Henderson, 406 Market St., St. Louis, Zone 2, archt. CD 1/26.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MINNESOTA**—State Hy. Dpt., 1246 University Ave., St. Paul, rejected bids Jan. 21, grading, paving 13.3 mi. between Jct. TH 91 and Ada, Norman Co., LB $816,559; grading, paving 1.4 mi. in Adam Norman Co. LB $234,624; gravel base, road-mixed bit. surf. 18.6 mi. between Manley and Jasper, Rock Co., LB $241,874; grav. base, road-mixed bit. surf. 27.6 mi. between Big Falls and Pelland, Koochiching Co., LB $286,559. Will re-advertise. CD 1/26, under LB.

▲ **Geo. Sheaf & Co.**, 20 W. Ninth St., Kansas City, Mo. CA $3,127,950. Turkey Creek Pumping Station, reservoir, 24 and Allen Sts., KANSAS CITY, MO. City, Water Dpt., City Hall, Kansas City, Mo. Black & Veatch, 4706 Broadway, Kansas City, Mo., engrs. Awarded Feb. 8. CD 10/14/53.

▲ **OKLAHOMA**—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,

Banta Constr. Co., Enid, Okla., LB $431,765, est. $487,427, c. concrete pavement and underpass 0.354 mi. US 81, at Enid, Garfield Co.;

G & A Constr. Co., Pawhuska, Okla., LB $95,947, est. $102,880, c. conc. 0.477 mi. U. S. 64 in Pawnee, Co.;

F. W. Hinrichs Constr. Co., 3602 Pine St., Tulsa, Okla. LB $114,908, est. $150,184, grading, drainage 4.715 mi. St. Hy. 10 at Wyandotte, Ottawa Co.;

W. E. Logan & Sons, Barnes Bldg., Muskogee, Okla., LB $246,356, est. $291,673, grading, drainage 5.835 mi. US 75 at Coalgate to the Hughes Co. line, Coal Co.; LB $251,711. est. $311,657, grade drainage 7.699 mi. US 62 between Okemah and Castle, Okfuskee Co.;

Pool Constr. Co., Shawnee, Okla., LB $153,788, est. $191,227, stabil. aggregate base, double bit. surf. 7.053 mi. Hy. 31, at Bokoshe, LeFlore Co.;

Public Constr. Co., Surety Blvd., Muskogee, Okla., LB $155,911, est. $201,759, stabil. aggregate base with double bit. surf. course 7.874 mi. HY. 82, at Welling, Cherokee Co.;

Smith Bros., Noble, Okla., LB $95,367, est. $120,161, stabil. aggregate base with double bit. surf. 4.188 mi. Hy. 87 at Idabel, McCurtain Co.; LB $178,694, est. $227,110, stabil. aggregate base with rock asph. surf. 5.803 mi. Hy. 9-A, at Maud, Pottawatomie Co.;

W. E. Steelman, 2800 N.E. 4th St., Oklahoma City, Okla. LB $171,589. est. $168,855, asph. stabil. base with single bit. surf. 6.069 mi. State Hy. 95 at Guymon, Texas Co. Bids Feb. 8. CD 1/25.

▲ † **Nolan Brothers, Inc.**, Box 9157, Grants Lane, Fort Worth, Tex., CA $4,127,454, airfield pavement etc. Sherman-Clinton Air Force Base, NOY 77547, CLINTON, OKLA. Bureau Yards & Docks, Dpt. Navy, 8th Naval Dist., Bldg. 16, Naval Station, New Orleans (Algiers), La. Bids Feb. 3. CD 2/14, under LB.

▲† **H. B. Zachry Co., Constr. Div.**, Box 2570, San Antonio, Tex., LB $5,330,749. constr. and paving runways, taxiways, aprons, runway lighting, ENG-41-243-55-33, KELLY AIR FORCE BASE, TEX. U. S. Eng, P. O. Box 1229, Galveston, Tex. Bids Feb. 9. CD 1/4.

▲† **Malcolm M. Larson**, 4080 Galopago St., Denver, Colo., LB, $1,493,718, est. $1,598,060, Alcova-Gering and Lingle Tap, 115-kilovolt transmission lines Tranmission Div., Missouri River Basin Proj. Spec. DC 4329, WYOMING-NEBRASKA Bureau Reclamation, Dpt. Interior, Casper, Wyo. Bids Feb. 9. CD 1/4.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **A. H. Neumann & Bros. Inc.**, 514 Hubbell Bldg., Des Moines, Ia. CA $1,232,000 TELEPHONE BLDG., DES MOINES, IA. Northwestern Bell Telephone Co., 609 9th St., Des Moines, Ia. Bids Dec. 14. CD 12/30, under LB.

E. T. McMurray Co., 1901 Vine St., West Des Moines, Ia. Owner Builds, $825,000. HOUSING, WEST DES MOINES, IA.

J. S. Morgan & E. A. Rossum, Owners Valley View Addition, Inc., 3812 N. 48 St., Omaha, Neb., Owner Builds. $500,000. new SUBURBAN addn., grade, layout streets, install utilities and build dwellings, just south of OMAHA, NEB.

▲ **Jack Stewart & Son**, 3041 Kentucky St., Topeka, Kan. Owner Builds. $1,500,000. 152 HOUSES, Stewart Countryside Addition, TOPEKA, KAN.

B. H. Todd & Son, Ada, Okla., LB $519,800. STUDENT UNION BLDG., Southwestern State College, WEATHERFORD, OKLA. Bd. Regents, Capitol, Okla. Bids Feb. 9. CD 1/25.

Jacinto Oaks, Inc., under J.B. Belin, Jr. & J. Mallette, 805 N. Post Oak St. Houston, Tex., CA $698,000. (B) 30 DWELLINGS, (C) 25 DWELLINGS, HOUSTON, TEX. Jacinto Oaks, Inc., 805 N. Post Oak St., Houston, Tex. CD 12/28.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Wash., Arlington**—BA 3/8—P. Wks. Officer, Thirteenth Naval Dist., 1611 W. Wheeler St., Seattle, water treatment plant, 250,000-gal. steel reservoir, develop water source, altering distr. sys. at Naval Radio Station, Specs. 40893. Plans deposit $30. CD 7/3/47, under Unclassified.

SOON LETS CONTRACT—BUILDINGS

▲ **Nev., Las Vegas**—HOTEL—At office Cliff Jones, 230 S. 5th St., soon lets contract rein.-con., structural framing in public areas, Freemont Hotel, for Louis R. Lurie, 333 Montgomery St., San Francisco, Calif. $2,000,000. McAllister & Wagner, 1121 St. Hill St., Los Angeles, Calif., archts. Brandow & Johnston, 501 S. Boylston St., Los Angeles, Calif., John A. Martin, 1830 Wilshire Blvd., Los Angeles, Calif., and Dames & Moore, 816 W. 5 St., Los Angeles, Calif., engrs. CD 8/12.

Utah, Salt Lake City—BANK—Continental Bank & Trust Co., Walter E. Cosgrief, Second South and Main St., soon lets contract 3 story bank exten., West 2nd South St., west of present bldg. $700,000. R. Lloyd Snedaker, 706 Utah Savings & Trust Bldg., archt. CD 7/28.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Midland Constructors, Inc.**, 3332 E. Florence St., Huntington Park, Calif., LB $509,924, tower work, 48.1 mi. Schedules 1, 2, 3 and 4, Inv. 7536, Wasco, Marion and Linn Counties, Oregon. Bonneville Power Admin., 1001 N. E. Lloyd Blvd., Portland, Ore. Bids Feb. 4.

(Continued on page 68)

HYDRAULICS FOR MOBILE EQUIPMENT

VOL. 2

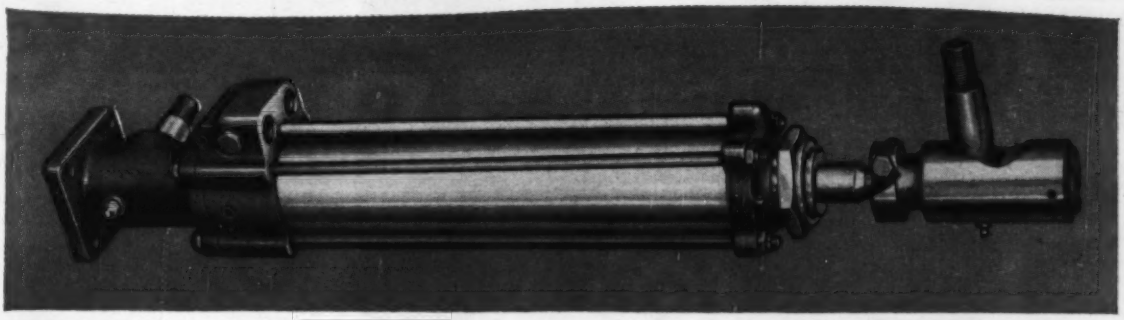
Mobile Equipment News

VICKERS INCORPORATED, DETROIT, MICHIGAN

IMPROVES PERFORMANCE • CUTS COSTS

NO. 5

New! VICKERS® HYDRAULIC POWER STEERING BOOSTER...SERIES S23



LATEST DEVELOPMENT in POWER STEERING for TRUCKS, BUSES, MATERIALS HANDLING VEHICLES, ROAD CONSTRUCTION and MINING MACHINERY

More compact . . . improved in operating characteristics . . . this new Vickers Steering Booster, Series S23 is an important new development in power steering for many vehicles. Application is much easier because it requires less space . . . and ultimate costs are substantially lower. Series S23 thus opens the way to fingertip ease of steering for a wide range of additional vehicles.

Like the preceding models, Series S23 has hydraulic lock against road shock. Bumps, chuckholes, blown front tires, obstructions, etc., cannot spin the steering wheel or jerk it out of control. This is a safety factor of great importance.

Series S23 Boosters are provided either with (Model S23R) or without (Model S23N) an integral relief valve. Model S23N is used with Vickers VT16 and VT17 pumps that have integral volume control and relief valve. When the larger volume Series V200 pump is used and a volume control is required in the circuit, the S23N is used with a separate combination valve (see Series FM2 below). Model S23R is used with the Series V200 pumps that have no integral valving, for applications where a volume control is not required.

MORE VERSATILE INSTALLATION

In Series S23 Boosters, the servo ball stud housing is symmetrical, and can be assembled in any one of four positions. This and the compactness of the Booster makes application easier . . . increases the number of applications which can be made without major engineering changes. Series S23 Boosters can be mounted interchangeably with Models S6-277 and S6-279 Boosters.

REQUIRES LESS SPACE

The new booster has been reduced in size by the redesign of the servo control valve. The tube connecting the servo valve to the rod end has been relocated and is now on the same side as the fitting connection. As a result of these changes, Series S23 requires less space . . . works in closer quarters.

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7062

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DIVISION OF THE SPERRY CORPORATION

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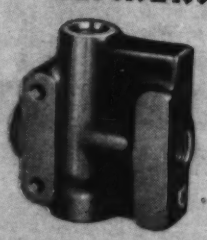

Five sizes of Series FM2 Valves were developed primarily for hydraulic power steering on trucks, buses and materials handling equipment where the pump does not include a volume control valve. The FM2 improves steering booster performance by providing a relatively constant volume of oil regardless of engine speed variations. An integral relief valve is included.

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

(Continued from page 66)

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **E. I. duPont de Nemours & Co.**, du Pont Bldg., Wilmington, Del., Own Forces, tetraethyl lead mfg., anti-knock additive for gasoline and freon refrigerants PLANT on tract about 500 acres 2 mi. east of ANTIOCH, CALIF.

H. B. Nicholson, 880 E. Colorado St., Pasadena, Calif., CA $656,000 1 story, frame, stucco multi-purpose bldgs. at various SCHOOLS, Camelia Ave., Chase and Loren Sts., LOS ANGELES, CALIF. Bd. Educ. 1425 S. San Pedro St., Los Angeles, Calif. Bids Jan. 5. Bowerman, Hobson & Winter, 4638 Hollywood Blvd., Los Angeles, archts. CD 4/15.

▲ **Geo L. Mallery Co., Inc.**, 1124 S. Beverly Dr., Los Angeles, Calif., Owner Builds, $1,264,800. 206 DWELLINGS, Alburtis St., Corley Ave., Flatton St., NORWALK, CALIF.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

▲ **British Columbia**—RAILWAY—BA 3/10—Pacific Great Eastern Ry. Co., W. A. C. Bennett, pres., 736 Granville St., Vancouver, railway, Prince George North 270 mi. to Dawson Creek mile 0 to mile 20. $3,000,000-$4,000,000. CD 2/12/54.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

NOVA SCOTIA—Dpt. Hys. & P. Wks., Parliament Bldgs., Halifax,

Tidewater Constr. Co., Ltd., Parkdale St., New Glasgow, N. S., CA $674,000, reconstr., subgrade, grav. surf. 8½ mi. road from Heatherton to Antigonish. Awarded Feb. 1.

Simard & Freres Co., Ltd., 3 Ave. East., Amos, Que. CA $350,000, municipal electric power plant, concrete dam, power plant and about 8 mi. transmission lines PARENT, QUE. Municipality, Parent, Que. Bids Jan. 10, awarded Feb. 4. CD 1/5.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Saguenay-Kitimat Co.**, Sun Life Bldg., Montreal, Que., CA ALUMINUM SMELTER expansion, KITIMAT, B. C. Aluminum Co. of Canada Ltd., Sun Life Bldg. Montreal, Que. CD 1/9/51.

▲ **B. Perini & Sons (Canada) Ltd.**, 49 Jackes St., Toronto, Ont., CA $4,900,000, 15 buildings, Army Camp, Gagetown, FREDERICTON, N. B. Defense Constr. (1951) Ltd., 56 Lyons St., Ottawa, Ont. Bids Dec. 2. CD 11/8.

▲ **Goroll Constr. Co.**, Front St., Sarnia, Ont., CA $1,000,000, 110 one story, clay brick HOMES, Murphy Road-Errol Road Section, SARNIA, ONT. Ernest Ridout Ltd., 366 Christian St., Sarnia, Ont. Awarded Feb. 10.

▲ **Dubord & Frere Ltee**, 5047 Queen Mary Road, Dorval, Que. Owner Builds $2,500,000, 200-unit HOUSING DEVELOPMENT, on new streets, DORVAL, QUE. W. J. Rosenberg, 1226 St. Catherine St. W., Montreal, Que., archt.

▲ **Jay-Mar Construction Co. Ltd.**, 545 St. Roch St., Montreal, Que., Owner Builds, $1,300,000. HOUSING DEVELOPMENT, 45 Ave., Rosemount and Lemay Sts., Rosemount suburban area, MONTREAL, QUE. CD 2/3.

▲ **B. Kaplan Constr. Co., Ltd.**, 4120 City Hall Ave., Montreal, Que. Owner Builds, $1,000,000, 12-APARTMENTS, Leomoine St., MONTREAL, QUE. R. Fisher, 3177 St. Sulpice St., Montreal, Que., archt.

Proposed Projects

WATER SUPPLY

Ill., East St. Louis—East St. Louis & Interurban Water Co., S. C. Casteel, genl. mgr., 513 Missouri Ave., 10 m.g. per day to the filter capacity East St. Louis plant on Front St., $600,000; 300,000 gal. water storage tank with foundations, etc. and addnl. water distr. lines, Alorton, $150,000.

▲ **Mich., Farmington**—Farmington Twp., 40 mi. 24 in. water mains, 3 wells, reservoir, self contained sys. southern and eastern sections of twp. $1,500,000, Pate & Hirn, 532 Michigan Bldg., Detroit, consult. engrs.

▲ **Mich., Warren**—Bd. Trustees Warren Twp., Warren, filtration plant, 6 mi. feeder mains from Lake St. Clair (plant location) to township. $5,000,000.

SEWERS, WASTE DISPOSAL

Pa., Perrysville—Bd. Comrs. McCandless Twp., Perrysville, trunk sewers, sanitary sewers, McCandless Twp. $500,000. Wm. Herbert, Bradford Woods, Pittsburgh, engr.

Tex., San Antonio—City, City Hall, Military Plaza, sewage disposal plant unit. $800,000. Irving S. Seligmann, Kallison & Walsh Bldg., consult. engr. CD 1/27/54.

BRIDGES

▲ **ARKANSAS—State Hy. Dpt., Capitol, Little Rock,**
Benton Co.—bridge, approaches over Flint Creek, State Hy. 59, $70,000.

Cleveland Co.—bridge, approaches 2.2 mi. over Saline River, State Hy. 79, $969,000.

Poinsett Co.—7 bridges, State Hy. 41, $180,000.

Pulaski and Faulkner Counties—parallel bridge U. S. Hy. 65, $55,000.

Scott and Yell Counties—replacement of bridges State Hy. 80, Waldron-Danville, $60,000.

White Co.—constr. highwater bridge over Little Red River, State Hy. 124, $170,000.

MAINE—State Hy. Comn., State House, Augusta,

Fort Fairfield—bridge over Aroostook River, $750,000.

† **Maryland**—U. S. Eng., First and Douglas Sts. N. W., Wash. 25, D. C., railroad bridge over Anacostia River, $500,000-$1,000,000.

STREETS AND ROADS

▲ **ARKANSAS**—State Hy. Dpt., Capitol, Little Rock,
Benton Co.—grading, minor drainage, structures and surf. 2 mi. State Hy. 102, $70,000.

Monroe Co.—addnl. grav. surf. 14.1 mi. State Hy. 39, $41,800.

Phillips Co.—grading, drainage, surf. 10.9 mi. State Hy. 1, $500,000.

St. Francis Co.—addnl. grav. surf. 11.3 mi. State Hy. 38, $45,600.

Saline and Garland Counties—2 lanes, c. conc., relocating hy. 27.2 mi. U.S. Hy. 67-70, Benton-Hot Springs, $2,827,000.

▲ **RHODE ISLAND**—State of R. I. and Providence Plantations, F. A. Adams, purch. agt., State House, Providence,

Cranston—1 mi. Park Ave., Elmwood to Warwick Aves., Hy. S-0230 (1), $240,000.

1.1 mi. Dyer Ave., Providence Line to Cranston St., Hy. S-0306 (1), $300,000.

Cumberland—2.6 mi. West Wrentham Rd., Mendon to Wrentham Rds., Hy. S-0243 (1), $250,000.

North Kingstown—highway-overpass, 1 mi., East Greenwich, West Davisville Rd. overpass to Frenchtown Rd., $230,000.

Providence—highway-bridge, Contr. 2, Brook St. to South Water St., constr. all struct. roadway, ramps, east abutment of Providence River Bridge, 0.4 mi.. UI-03 (4), $2,760,000. CD 8/18/53.

Tiverton—2.8 mi. Stafford Rd., Fall River Line to Bulgarmarsh Rd., S-0262 (2), $425,000.

Washington—9.5 mi. Nooseneck Hill Rd. relocation to Conn. Line-Interstate Rte. No. 1, constr. pavement, completion of proj. from Baker Plain to Conn. Line, FI-01 (6), $2,500,000.

Wash., Seattle—City, County-City Bldg., Zone 4, paving W. Genesee and adjacent streets. $978,000.

EARTHWORK, WATERWAYS

▲ **Calif., Salinas**—Monterey County Flood Control Dist., Court House, $7,000,000 bond election Apr. 26, Nacimiento Dam near Camp Roberts for flood control. CD 5/12.

▲ **Washington**—Douglas County Public Utility District, Waterville, hydro dam at Wells site on Columbia River, Azwell. $250,000,000. W. S. McCrea Eng. Co., Perkins Bldg., Tacoma, consult. engrs. for power production costs. CD 10/22.

AIRPORTS

† **Mass., Worcester**—AIRCRAFT CONTROL BLDG.—U. S. Eng., 857 Commonwealth Ave., Boston, plans by M. A. Dyer Co., 24 School St., Boston, aircraft control bldg., Municipal Airport. $500,000.

▲† **N. D., Minot**—JET FIGHTER BASE—U. S. Eng., 1709 Jackson St., Omaha, Neb., plans by Kurke Assocs., archts.-engrs., 1117 13 Ave. N., Fargo, jet fighter base. $10,000,000. Henningson, Durham & Richardson, 2962 Harney St., Omaha, Neb., consult. engrs. CD 12/30.

▲ **Tex., Beaumont** — AIRPORT IMPRVS. — Jefferson County, Airport Div., Court House, bond election Mar. 12, Prop. 1, runway exten., $566,567; bldg. and paving safety zones, $75,000; constr. instrument landing sys., $95,000; strengthening existing runways, $150,000; strengthening existing taxiways, $100,000; strengthening existing ramps, $90,000. W. O. Bower, county engr. CD 1/26.

▲ **Ont., Ottawa**—TERMINAL—Dpt. P. Wks., Hunter Bldg., plans by Gilleland & Strutt, 86 Greenfield Ave., terminal bldg., Uplands Airport. $3,000,000. CD 11/22.

LATIN AMERICA

▲ **Mexico, Monterrey**—Petróleos Mexicanos, Juarez, 104, Mexico City, plans oil refinery. $3,000,000.

Mexico, Valle de Ponas—Sria de Recursos Hidraulicos, P. de Reforma, 69, Mexico City, plans irrigation dam. $640,000.

PUBLIC BUILDINGS

▲ **Calif., Anaheim**—SCHOOLS—Anaheim High School Dist., Anaheim, $3,015,000 bond election Apr. 5, Junior High School and addns.

▲ **Calif., Downey**—SCHOOL—Downey Union High School Dist., Downey, plans by S. B. Barnes & John S. Gregory, C. K. Deuman & H. T. MacDonald 5749 W. Wilton Pl., Los Angeles. 89,955 sq. ft. Earl Warren High School, $1,500,000.

Calif., Fort Bragg—SCHOOL—Fort Bragg Union High School District, Fort Bragg, $625,000 bond election Mar. 25, schools. Bond election date extended.

▲ **Colo., Boulder**—SCHOOLS—Boulder County School District, Boulder, $1,500,000 bond election Mar. 8 schools.

Colo., Colorado Springs — SCHOOLS — Cheyenne Mountain School Dist. No. 12, 1200 West Cheyenne Rd., voted bonds, 2 elementary schools $535,000. Edwin A. Francis & Carlisle B. Fuy, 401 Mining Exchange Bldg., Colorado Springs, consult. engrs. CD 1/19.

▲ **Colo., Durango**—COLLEGE CAMPUS—State of Colorado, Fort Lewis A & M College, Hesperus, plans by James M. Hunter, 2049 Broadway, Boulder, constr. college campus at Durango. $1,500,000.

▲ **Conn., Middletown**—INTENSIVE TREATMENT—State, R. G. Macy, P. Wks. Comr., State Office Bldg., Hartford, plans by Walter Crabtree, Jr., 195 Fern St., West Hartford, intensive treatment bldg., State Hospital. $5,383,000. CD 4/22/53.

▲ **Conn., Middletown**—TRADE SCHOOL—State, R. G. Macy, P. Wks. Comr., State Office Bldg., Hartford, trade school $1,450,000.

▲ **Conn., New Haven**—MARKET FACILITY—Conn. Market Auth., Francis H. Adams, exec. secy., R. G. Macy, P. Wks. Comr., State Office Bldg., Hartford, regional market facility, $2,000,000.

Conn., Norwalk—HIGH SCHOOL—Diocese of Bridgeport, 357 Washington Ave., plans by Lyons & Mather, 211 State St., Bridgeport, high school, West Rock Ave, between Parkway and Post Rd. $500,000. CD 1/5.

Del., Greenwood—SCHOOL—Greenwood School District, Greenwood, Greenwood School addn. $600,000.

▲ **Ill., Collinsville**—SCHOOLS—Collinsville Community Unit 10 School District, Bd. Educ., D. K. Darling, supt. Schools, Collinsville, plans by Albert M. Goedde, 1452A State St., East St. Louis, elementary school State Park Place north of U. S. 40; elementary school adjacent to Collinsville High School athletic field; Collinsville High School addn., and Miller Elementary School addn. $1,050,000. CD 1/4.

▲ **Md., Baltimore**—STUDENT UNION, etc.—University of Maryland, Fidelity Bldg., plans by Lucius White, Jr., 1009 N. Calvert St., student union bldg. built in sections approx. $250,000 each, $1,000,000; plans by Wm. F. Stone Jr., 2612 N. Charles St., nurses' residence and school, $400,000. CD 6/15, under LB.

▲ **Mass., Boston**—HOSPITAL—State, Dpt. Mental Health c/o Div. Bldg. Constr., 38 Chauncy St., Boston, plans by Desmond & Lord, 6 Beacon St., Boston, M-807 Psychopathic hospital addn., $1,000,000.

▲ **Mass., Concord**—POWER PLANT—State, Dpt. Correction, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, P-801 power plant, Massachusetts Reformatory. $1,000,000. Merrill Assoc., 210 South St., Boston, consult. engrs.

Mass., Lowell—HOME—City, Frank Barrett, mgr., City Hall, plans by Shepley, Bulfinch, Richardson & Abbott, 1 Court St., Boston, convalescent home, West Meadow Rd. $800,000.

Mass., Monson—POWER PLANT—State, Dpt. Mental Health, c/o Div. Bldg. Constr. 38 Chauncy St., Boston, M-803 imprv. power plant and utilities, State Hospital, $900,000, Utilities Eng. Corp., 359 Boylston St., Boston, consult. engrs.

▲ **Mass., Northampton** — ADMISSION — State, Dpt. Mental Health, c/o Div. Bldg.-Constr., 38 Chauncy St., Boston, plans by Perley F. Gilbert Assoc., Inc., 53 Central St., Lowell, chronic admission bldg., State Hospital, $1,876,000. CD 7/21/52.

▲ **Mich., Detroit**—SCHOOL—City, Bd. Educ., 1354 Broadway, plans by Smith-Hinchman & Grylls, Inc., 800 Marquette Bldg., 3 story, rein.-con. Northwest High School, Seven Mile Rd. and Hoover St. $5,000,000. CD 4/20.

▲ **Mich., Hazel Park**—HOSPITAL—City, Hospital Comm., Dr. Leon F. Simon, chn., Hazel Park, plans by Smith-Hinchman & Grylls, Inc., 800 Marquette Bldg., Detroit, hospital. $1,000,000.

Mich., Newberry—DETENTION-CUSTODIAL BLDG.—State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, detention-custodial bldg., Newberry State Hospital. $574,000.

Minn., Virginia—COMMUNITY CENTER—City, J. G. Milroy Jr., clk., plans by Damberg & Damberg, Virginia, miners' memorial community center. $625,000. CD 2/15/54.

Mo., Cape Girardeau—SCIENCE—Southeast Missouri State College, W .W. Parker, pres., Cape Girardeau, rein.-con., steel, brick science bldg., $700,000. CD 5/27/47.

▲ **N. J., Lakewood**—SCHOOL—Lakewood Bd. Educ., Lakewood, bond election Mar. 15, high school, $1,402,000. Micklewright & Mountford, 72 Ewing St., Trenton, archts. CD 10/14.

N. J., Trenton—SCHOOL—Bd. Educ., 9 S. Stockton St., vocational school, Greenwood and Hamilton Aves. $500,000.

N. D., Grafton—HOSPITAL WARD—State Bd. Admin., Bismarck, hospital ward bldg. at State School. $500,000.

▲ **O., Akron**—POLICE HEADQUARTERS—City, Leo G. Walter, Serv. Dir., City Hall, police headquarters bldg., incl. some city offices, jail, gym, courts, parking in Glendale Park land. $1,500,000. CD 5/21/45.

▲ **O., Canton**—PARKING UNITS—City, Carl F. Wise, mayor, City Hall, two ramp-style parking units, one 4 story unit for 356 cars between 2nd and 3rd Sts.,

on N. Cleveland Ave., other for 189 cars between 2nd and 3rd Sts. on Market Ave. South. $1,600,000. CD 4/26.

O., Cuyahoga Falls—SCHOOL—Bd. Educ., Cuyahoga Falls, plans by Beiswenger, Hoch & White, 661 W. Market St., Akron, grade school, 13th St. and Silver Lake Ave. $500,000. CD 11/11/52.

▲ O., Oxford—RESIDENCE HALLS—Miami University, John D. Millett, pres., Oxford, 5 residence halls. $3,750,000.

▲ Pa., Bridgeville—SCHOOLS—Municipal Auth. of Bethel, P. O. Bridgeville, plans by Charles M. & Edward Stotz, 801 Bessemer Bldg., Pittsburgh, 2 story, bsmnt., brick, block, steel John McMillan Grade School. $550,000; plans by Altenhof & Bown, 1230 Park Bldg., Pittsburgh, 1 story, brick, block, steel Ben Franklin Grade School. $550,000.

Pa., East Greenville—HIGH SCHOOL, etc.—Upper Perkiomen Joint School Bd., East Greenville, plans by Wolf & Hahn, 459 Hamilton St., Allentown, high school addn. and gymnasium, $500,000. CD 11/5/53.

▲ Pa., Newtown Square—HIGH SCHOOL—Marple-Newtown Joint School Bd., Newtown Square, plans by Baader, Young & Schultze, 1500 Walnut St., Phila., Marple-Newtown Joint Senior High School at Newtown. $1,250,000.

▲ Tex., Arlington—HOSPITAL—City, hospital. $1,000,000.

Tex., Athens—HIGH SCHOOL—Athens Independent School Dist., Athens, voted bonds Jan. 29, high school, one elementary school. $500,000. Wyatt C. Hedrick, 5201 Fannin St., Houston, consult. engr.-archt. CD 1/26.

▲ Tex., Birdville — SCHOOLS — Birdville Independent School Dist., c/o W. G. Thomas, supt., voted bonds Feb. 5, two Junior High Schools and addn. to existing high school. $3,000,000.

Tex., Brownsville—HIGH SCHOOL—Catholic Diocese, c/o Bishop Garriga, Brownsville, plans by Caudill, Rowlett, Scott & Assocs., 425 S. Main St., Bryan, high school and wing to Villa Maria High School, $500,000. CD 12/8.

Tex., McAllen—SCHOOL—McAllen Independent School Dist., McAllen, voted bonds Jan. 29, group of school classrooms. $500,000. CD 4/11/50.

▲ Tex., Sundeen—SCHOOLS—Sundeen Independent School Dist., Sundeen, voted bonds Jan. 29, constr. group upper grade classrooms, $450,000; group of lower grade classrooms, $550,000. CD 2/2.

▲ Vt., Burlington—DORMITORY—University of Vermont and State Agriculture College, Supt. Bldgs & Grounds, Burlington, plans by Freeman, French & Freeman, 130 Church St., womens dormitory on Redstone Campus. $1,800,000. CD 3/19/52.

Wash., Seattle—MUSEUM—University of Washington, Seattle, Zone 5, building to house Washington State Museum. $600,000. CD 2/14/49.

▲ Wash., Sedro-Wooley—SCHOOLS—School Bd., Sedro-Wooley, bond election Mar. 8, Junior High School, $800,000; Senior High School addn., $500,000. CD 5/29/51.

Wash., Wenatchee—SCHOOL—School Dist. 46, Wenatchee, plans by Naramore, Bain, Brady & Johanson, 904 7 Ave., Seattle, and A. S. Erickson, Wenatchee, Junior High School. $500,000. CD 11/10.

Alta., Edmonton—SCHOOL—Edmonton Public School Bd., Edmonton, 30-room high school in Northwest Subdivision. $650,000.

▲ Ont., Belleville—FEDERAL GOVERNMENT—Dpt. P. Wks., Hunter Bldg, Ottawa, plans by E. A. Gardner, ch. archt., c/o owner, Watson & Wiegand, 344 Front St., Canadian Federal Government Bldg. $1,150,000.

▲ Que., Quebec City—POST OFFICE—Dpt. P. Wks. Hunter Bldg., Ottawa, Ont., plans by E. A. Gardner, ch. archt., c/o owner post office Henderson St.. $2,000,000.

COMMERCIAL BUILDINGS

▲ Calif., Hayward—DEPARTMENT STORE—Emporium-Capwell Co., 835 Market St., San Francisco, department store, branch on site near Hayward High School. $6,000,000.

▲ Calif., Los Alamitos—DWELLINGS—Alamitos Homes Penney Co., 3460 Wilshire Blvd., Los Angeles, 3 story, department store, 5 and Pine Sts. $2,000,000.

▲ Calif., Los Alamitos—DWELLINGS—Alamitos Homes Inc., c/o E. H. Fickett, archt., 5657 Wilshire Blvd., Los Angeles, 270 frame, stucco dwellings in Orange County. $2,500,000.

Calif., West Covina—DWELLINGS—Harry Elliot, c/o E. H. Fickett, archt., 5657 Wilshire Blvd., Los Angeles, 55 frame, stucco dwellings, $500,000.

Colo., Denver—MOTEL—Hampden Development Co., 3800 S. Albion St., project rejected by zoning board, one and two story 253 room ranch type hotel, Hampden and Valley Hy. $750,000. CD 2/2.

Colo., Leadville—HOSPITAL—St. Vincent's Hospital, Leadville, plans by Linder & Wright, Insurance Bldg., Denver, Colo., 1 story, brick new hospital. $650,000. CD 9/28.

Conn., New London—SHOPPING CENTER—Martin T. Olsen, Fort Hill, Groton, 15-store shopping center, $600,000.

▲ Fla., Palm Beach—APARTMENT DEVELOPMENT—Joseph Mass, c/o John H. Graham & Assocs., archts., 2430 Pennsylvania Ave. N.W., Wash., D. C., 271-unit apartment development, incl. swimming pool and commercial facilities on Coconut Row, $6,000,000.

▲ Ill., Centralia—HOSPITAL—St. Mary's Hospital, Centralia, plans by Maguolo & Quick, 4908 Delmar Blvd.,

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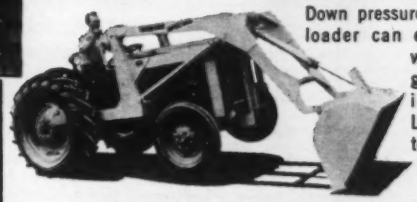

Down pressure so great, this loader can even lift front wheels off the ground. Removes in ten minutes. Lifts 2,000 lbs. to 9 ft.

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Working in combination with Hydro-Clam for digging spot excavations, the Loadmaster performs many labor saving jobs. This heavy duty industrial type loader has double acting, oversize hydraulic system. Raising height sufficient to clear average size trucks equipped with sideboards. Bucket capacity is 12 cu. ft. High down pressure enables digging and handling of tough, hard-packed material. Bucket roll-back is provided for handling loose material.

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St. Louis 8, Mo., 4 story, penthouse 120-bed hospital and nurses home. **$2,500,000.**

▲ **Ill., Chicago**—ADMINISTRATIVE, etc.—Art Institute of Chicago, Michigan Ave. at foot of Adams St. administrative and service units bldg. addns. **$1,200,000.**

▲ **Ill., Chicago** — STUDIOS EXPANSION — Merchandise Mart, 222 W. North Bank Dr., plans by Shaw, Metz & Dolio, 208 S. La Salle St., Zone 4, for national broadcasting Co. studios expansion 2 top floor addns., (A) 2 story 168x305 ft. (B) 2 story, 150x160 ft. **$1,500,000.**

Ill., Jacksonville—HOSPITAL—Our Savior's Hospital, Jacksonville, rein.-con., steel, stone, brick hospital. **$750,000.**

▲ **Ill., Springfield**—Y.M.C.A.—Young Men's Christian Assn., 317 S. 7 St., 8 story new Y.M.C.A. bldg. **$1,850,000.**

▲ **Ind., Evansville**—STORE—De Jong's, Inc., 306 Main St., plans by Victor Gruen & Assocs., 1905 Industrial Bank Bldg., Detroit, Mich., 70x150 ft. store with 3 deck parking area site, at 21 N. W. Fourth St. **$1,000,000.**

Kan., Wichita—SHOPPING CENTER—Geo. P. Consolver, N. C. Consolver & B. G. Consolver, c/o Fidelity Realty Co., 137 N. Main St., plans by Hissem & Lytle, 502 E. Douglas St., shopping center, **$750,000.**

▲ **Ky., Louisville**—MOTEL—J. Graham Brown, Brown Hotel, plans by C. D. Sommerich, 1800 Olive St., St. Louis, Mo., 1 story motel with swimming pool, Bardstown Rd. **$1,500,000.**

▲ **Mass., Saugus** — SHOPPING CENTER — Milton G. Green & Allen J. Green, 1368 Beacon St., Brookline, plans by The Architects Collaborative, 96 Mt. Auburn St., Cambridge and Ketchum, Gina & Sharp, assoc. archts., 227 E. 44 St., New York, N. Y., shopping center Newburyport Turnpike Main and Essex St. **$4,000,000.** CD 1/13/54.

Mich., Allen Park—CHURCH—Allen Park Presbyterian Parish, 6835 Park St., church, **$550,000.**

Mich., Royal Oak—Y.M.C.A. BLDG.—Young Men's Christian Assn., 1016 W. Eleven Mile Rd., plans by Clare W. Ditchy & Assoc., 605 W. Eleven Mile Rd., Y.M.C.A. in 3 sections (1) gymnasium, swimming pool, club rooms (2) workshop with game rooms (3) dormitory, **$500,000.**

▲ **Minn., Minneapolis**—SHOPPING CENTER—Midwest Constr. Equipment Co., W. E. Freeman, pres., 2831 University Ave., S. E., plans by Thorshov & Cerny, 400 Metropolitan Bldg., 40-store shopping center, 13 apartment units, 250 home sites, south of Hy. 12 and east of County Road 18 in Oak Knoll, **$15,000,000.**

Minn., St. Cloud—CATHEDRAL—Diocese of St. Cloud, Dr. W. T. Wenner, chn. of fund raising campaign, 812 St. Germain St., expansion of cathedral high school, **$750,000.**

▲ **Minn., St. Louis Park**—SCHOOL—Order of Christian Brothers & Brother J. Mark, principal De LaSalle High School, 25 Island Ave. W., Minneapolis, catholic boys' high school, South of Parkwoods Rd. west of Ottawa Ave. between Hy. 100 and 26 St. **$2,000,000.**

▲ **Mo., Ferguson (St. Louis 21 P.O.)**—PROFESSIONAL—Commercial Development Corp., Al E. Nick, secy., 42A South Florissant Rd., Zone 21, plans by Shapiro & Tisdale, 705 Chestnut St., St. Louis, Zone 1, 2 story, bsmnt., steel, concrete, masonry professional bldg., 100 block of South Church St. **$2,000,000**

▲ **Mo., Raytown**—SHOPPING CENTER—Leon & Harry Jacobs, Developers, 6314 Brookside Plaza, Kansas City, Mo., U-shaped shopping center, block long site, 142,000 sq. ft., 60,249 sq. ft. under roof, parking, 63 St. and Blue Ridge, **$1,250,000,** Curtis & Cowling, 912 E. 63 St., Kansas City, Mo., engrs.

Mo., St. Louis—SHOPPING CENTER—Marian Realty Corp., c/o Cornet & Zeibig, Inc., 37 N. Meramec Ave., Clayton, Zone 5, shopping center on tract 508x550 ft. incl. quarters for supermarket, drug store, large variety store, Broadway and Riverview Dr. **$350,000.**

▲ **N. Y., New York**—RESIDENCE HALL—New York University, 100 Washington Square, plans by Skidmore Owings & Merrill, 575 Madison Ave., Zone 22, 12 story residence hall, 401-435 E. 30 St. **$1,650,000**

▲ **Ore., Medford**—HOSPITAL—Medford Hospital Assn., Medford, plans by Rogers & Butler, 219 E. 44 St., New York, N. Y., hospital. **$1,700,000.** Harvey & Watkins, Medford, consult. engrs.

▲ **Tex., Austin**—COMMUNITY CENTERS, etc.—Builders Development Corp., c/o Turner Engineers, Nalle Bldg. Annex, Community Center No. 1, **$350,000;** Community Center No. 2, **$450,000;** resort hotel. **$1,500,000.**

Tex., Dallas—SHOPPING CENTER—J. M. Tuttle, Jr., 6 Lake Highland Shopping Village, plans by George Marble, 231 Lake Park Shopping Village, 15-unit shopping center in area Northwest Hy. and Eaton Rd. **$750,000.** CD 3/11.

Tex., Houston—GEOLOGY and BIOLOGY—Rice Institute, 6100 Main St., plans by Wilson, Morris & Crain, 3330 Graustark St., Lloyd & Morgan, 4605 Montrose St. & George & Abel B. Pierce, 603 W. Travis St., geology and biology bldg. **$750,000.** CD 12/21.

▲ **Tex., Houston**—DORMITORIES—Rice Institute, 6100 Main St., plans by Wilson, Morris & Crain, 3330 Graustark St., Lloyd & Morgan, 4605 Montrose St., and George & Abel B. Pierce, 603 W. Travis St., women's dormitory, **$725,000;** men's dormitory, **$650,000.** CD 3/3/50.

▲ **Tex., Houston**—DWELLINGS—Vest & Starkey, 9714 Bassoon St., 12 all-masonry dwellings, **$360,000;** 36 frame, brick trim dwellings, **$365,000;** 25 brick, stone dwellings, **$395,500;** 15 brick dwellings, **$385,000;** 18-all masonry dwellings, **$540,000;** 30 brick, stone trim dwellings, **$367,790** in segment of Westbury Subdivision.

▲ **Wash., Bellingham**—SHOPPING CENTER—Cornwall Corp., c/o G. Elford, 218 Unity St., shopping center. **$1,000,000.**

▲ **Wis., Milwaukee**—OFFICE—Beacon Federal Savings & Loan Assn., 769 N. Water St., plans by Bank Building & Equip. Corp. of America, 906 Sidney St., St. Louis, Mo. and Grassold-Johnson & Assocs. 734 N. Jefferson St., Milwaukee, office, **$5,000,000.**

Man., Brandon—STORE—T. Eaton Canada Ltd., 190 Yonge St., Toronto, Ont., store extension, **$500,000.**

▲ **Man., St. Boniface**—HOUSING DEVELOPMENT—Quality Constr. Co., Ltd., Toronto General Trust Bldg., Winnipeg, housing development, **$3,500,000.**

Ont., Toronto—APARTMENT—Lincoln Investments Co., c/o Mendelow & Keywan, archts., 1398 Eglinton Ave. W., 88 suite 9 story bsmnt., 53x125 ft., steel frame, brick apartment, Wellesley St. E. near Jarvis St. **$704,000.**

Que., Chicoutimi—SCHOOL—Owner c/o Lamontagne & Gravel, archts., 365 Racine St., 4 wings, 4 story, bsmnt., normal and elementary school addn. near Foyer Cooperative, **$500,000.**

Que. Donnacona—HOUSING—Rosaire Chalifox, Portneaf, Que., 100-unit housing development in mining area. **$800,000.**

INDUSTRIAL BUILDINGS

Calif., Gardena—FACTORY—Minneapolis Honeywell Regulator Co., 4494 Wayne Ave., Phila. 44, Pa., plans by Kenneth H. Neptune, 2840 E. Olympic Blvd., Los Angeles, 108,000 sq. ft. factory addn. **$500,000.**

▲ **Conn., North Haven**—PLANT—Knox Glass Assocs., Knox Penn, c/o Nathan Feldman, pres., 261 Wolcott St., New Haven, mfg. plant adjacent to freight yards of New Haven R.R., **$2,500,000.**

▲ **Fla., Miami**—PLANT—Miami Daily News, 600 Biscayne Blvd., newspaper plant, **$2,000,000.**

Ga., Atlanta—PARKING GARAGE—Pigeon-Hole Garages, Inc., c/o J. D. George, 121 Oil & Gas Bldg., Houston, Tex., mechanical off-street parking garage, automatic elevator entrances on both Broad and Whitehall Sts., on Marietta St. between Broad and Whitehall Sts. **$500,000.**

▲ **Ill., Franklin Park**—WAREHOUSE—Crane Co. 836 S. Michigan St., Chicago, Zone 5, plans by Ralph Stoetzel, 111 W. Monroe St., Chicago, Zone 3, 300,000 sq. ft. warehouse, **$3,000,000.**

▲ **Ky., Covington**—PLANT—Bavarian Brewing Co., 528 W. 12 St., plans by Elliston, Hall, McAllister &

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Stockwell, engrs.-archts., expansion of Plant No. 1 incl. bottling shop, main brewing plant addn., $1,500,000. CD 10/5.

▲ **Ky., Maytown**—PLANT—Kentucky-West Virginia Gas Co., Inc., Second National Bank Bldg., Ashland, hydro carbon recovery plant 10,000,000 in. ft. capacity of ethane, butane, propane and natural gas in liquid form, $9,000,000.

Minn., Red Wing—GRAIN TERMINAL—Burdick Grain Co., Grain Exchange Bldg., Minneapolis, grain terminal, $600,000.

O., Lebanon—FACTORY—R. A. Taylor Corp., 1917 Vine St., Cincinnati, factory-lithograph plant, Cincinnati Ave., 32-acre tract. $500,000.

▲ **Pa., Pittsburgh**—FACTORY—F. & B. Woodenware Co., 5556 Center Ave., 1 story approx. 150x520 ft., steel joist, brick, block factory, Saw Mill Run Blvd. $1,000,000.

Tex., Dallas—PLANT—Standard Pipe & Supply Co. and Frontier Mfg. Co., 3211 Main St., industrial plant expansion, 13-acre tract, Harry Hines Blvd., north of Walnut Hill Lane. $750,000.

Tex., Dallas—PLANTS—Texcrete Structural Products Co., Chalk Hill Rd., immediate expansion of plant, $125,000; future addnl. plant expansion and imprvs., $548,000.

▲ **Tex., Tyler**—PLANT—National Homes Corp., James Price, pres., By Pass, Lafayette, Ind., plant for mfg. 75 housing units daily. $2,000,000.

▲ **Va., Newport News**—MATERIAL UNLOADING FACILITY—Chesapeake & Ohio Ry. Co., Walter J. Tuohy, pres., Terminal Tower, Cleveland 1, O., 82 x 711 ft. bulk material unloading facility, incl. 3 unloading cranes, railroad cars will move by gravity through loading house. $8,307,000.

▲ **Wash., Seattle**—EQUIPMENT—Pacific Telephone & Telegraph Co., Third and Seneca Sts., Seattle, Zone 1, plans by Jones & Bindon, Hoge Bldg., Seattle, Zone 1, 6 story, 111 x 130 ft., equipment bldg. $1,500,000. CD 1/28.

Alta., Calgary—SALES and SERVICE—International Harvester Co. of Canada Ltd., 200 Hillyard Ave., Hamilton, Ont., plans by Kyles & Kyles, 247 John St. S., Hamilton, Ont., truck sales and service bldg. $750,000.

▲ **Alta., Edmonton**—PLANT—Inland Cement Co. Ltd., Northgate Bldg., cement plant. $7,000,000. Foundation of Canada Eng. Corp., 1900 Sherbrooke St. W., Montreal, Que., consult. engrs.

▲ **Que., Hull**—PLANT MODERNIZATION—E. B. Eddy Co. Ltd., Main St., 2 year plant modernization, incl. reconstr. Board Mill No. 8 machine and groundwood mills. $5,000,000. CD 4/7/53.

UNCLASSIFIED

▲ **Ill., Springfield**—FAIRGROUNDS IMPRVS.—State Div. Architecture & Eng., State Capitol, Springfield, plans by Louis Gerding, state archt., Springfield, constr. Illinois State Fairgrounds imprvs. $1,000,000.

▲ **Kentucky**—PIPE LINE—Kentucky-West Virginia Gas Co., Inc., Second National Bank Bldg., Ashland, pipe line to connect with company's main at Osborn Gap, Va., Floyd Co. $1,296,700.

Minn., Golden Valley (Minneapolis P. O.)—OUTDOOR THEATER—W. F. Stepnitz Agency, 1550 W. Larpenteur Ave., outdoor theater, 24-lane bowling alley Wayzata Blvd. near Pennsylvania Ave. $500,000.

▲ **Mo., St. Louis**—SKATING RINK—City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall and Mark C. Steinberg Charitable Trust, Municipal Courts Bldg., plans by Frederick Dunn, 1218 Olive St., St. Louis, Zone 3, 200 ft. in diam. ice and roller skating rink, 1 story 50 x 200 ft. recreational bldg. Forest Park west of 500 S. Kingshighway Blvd. to be known as Marck C. Steinberg Memorial, $1,000,000. CD 2/2.

N. Y., Flushing—PARK—Dpt. Parks, Arsenal Bldg., New York. P-270, reconstruction development, Weeping Beach Park. $326,000.

N. D., Jamestown—TELEVISION STATION-KFYR, Bismarck, television station, $100,000.

Okla., Tulsa—TELEVISION STATION—Oklahoma Educational Television Auth., State Capitol, Oklahoma City, television station, $233,000. George C. Davis, Munsey Bldg., Wash. 4, D. C., consult. engr.

Texas—TRANSMISSION LINES—Limestone County Electric Co-operative, Mart, transmission lines, sub-station, sys. imprvs., Limestone Co. $500,000.

Texas—RURAL DISTR. LINE—Taylor Electric Co-operative, Merkel, line extn. and sys. imprvs. $935,000.

▲ **Tex., Brownsville** — PORT CONSTR. — Port of Brownsville, F. W. Hofmokel, dir., Brownsville, 169,000 sq. ft. undercover shipside warehouse space of 500 x 250 ft., $1,250,000; 250 ft. waterside apron with double shipside tracks, $700,000; two railway spur sidings, $75,000; 235,000 sq. ft. rein.-con. flooring slab for storage serviced by five railway sidings, $565,000; imprv., dredging turning basin, $200,000; bldg. area dirt work, grading, general earthwork moving, filling, $75,000; constr. wharf shed on Dock No. 8, $175,000.

▲ **Tex., Dallas**—GAS LINES—Lone Star Gas Co., 1915 Wood St., gas line replacements inside city limits, $750,000; gas line replacements in Dallas County Rural Districts, $500,000; constr. new gas lines and existing line extensions in Dallas Area, $1,250,000. CD 5/1/47.

▲† **Alaska, Seward** — SHIPPING TERMINAL—The Alaska Railroad, Dpt. Interior, Anchorage, shipping terminal. $4,000,000.

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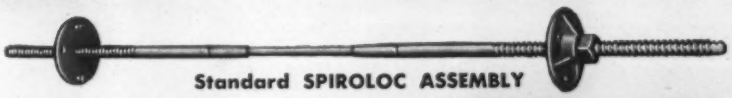

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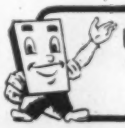

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STATE HIGHWAY LETTINGS
BRIDGES
February 28 Connecticut March 1 Massachusetts
STREETS AND ROADS
February 28 Connecticut March 3 Massachusetts
March 3 New Hampshire

BIDS ASKED—BUILDINGS

Mass., Waltham—SERVICE BLDG.—BA 3/3—State, Dpt. Mental Health, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, M-402 Contr. 1 service bldg. addn. Walter E. Fernald State School, Waverly, section of Belmont, $550,000. Plans deposit $40, refundable. Holmes & Edwards, 126 State St., Boston, archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ CONNECTICUT—State Hy. Dpt., State Office Bldg., Hartford,

Mariani Constr. Co., 222 Forbes Ave., New Haven, Conn., CA, $1,359,223, Proj. 316-02, bridges, grading, drainage Greenwich-Killingly Expressway, West Haven. Bids Jan. 24, awarded Feb. 10. CD 2/3, under LB.

▲ CONNECTICUT—State Hy. Dpt., State Office Bldg., Hartford,

Construction Aggregates Corp., 33 North LaSalle St., Chicago, Ill., CA $1,644,520, Proj. 215-05, 4,200,000 cu. yd. hydraulic borrow from dredging in Bridgeport Harbor, stockpiling same in contiguous areas, Greenwich-Killingly Expressway, Bridgeport and Stratford. Bids Jan. 24, awarded Feb. 10. CD 2/3, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Sewell & Smith Constr. Co., Irving Square, Framingham, Mass. LB $521,900. 2 elementary SCHOOLS Liberty St. and Hobart St., DANVERS, MASS. Town, School Dpt., Ivan Smith, supt., Conant St., Danvers, Mass. Bids Feb. 11. CD 2/1.

▲ Construction Units, Inc., 199 Washington St., Boston, Mass. CA Approx. $1,700,000. 115 RESIDENCES, College Acres, NORTH ANDOVER, MASS. Marrimack Valley Constr. Co., 199 Washington St., Boston, Mass.

Lexington-Winchester Building Corp., Theodore L. Freeman, 11 Lockland Rd., Winchester, Mass. Separate Contracts. $750,000. 80 RESIDENCES, Crawford Drive off Cambridge Rd., WOBURN, MASS.

▲ Blitman Constr. Corp., 101 Park Ave., New York, N. Y. LB $2,589,000. moderate rental HOUSING Proj. MR 55, STAMFORD, CONN. City Housing Auth., 100 Myano Lane, Stamford, Conn. Bids Feb. 15. CD 1/17.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
March 3 New Jersey
STREETS AND ROADS
March 2 Delaware

† Delaware and Maryland—BA 3/1—U. S. Eng., 2635 Abbottsford Rd., Phila., Pa., maintenance dredging Chesapeake and Delaware Canal, New Castle Co., Del. and Cecil Co., Md. $500,000. CD 12/31/52.

† N. Y., Plattsburgh—CLUB, etc.—BA 3/23—U. S. Eng., 111 E. 16 St., New York, Zone 3, officers club and mess, BOQ's FYY 55, Plattsburgh Air Force Base. $500,000-$1,000,000. Magoon & Salo, 607 Fifth Ave., New York, Zone 17, archts. CD 7/16.

† N. Y., Plattsburgh — RAILROAD RELOCATION — BA 4/13—U. S. Eng., 111 E. 16 St., New York, railroad relocation, FY 55, Plattsburgh Air Force Base. $100,000-$500,000. Extended date. Seelye, Stevenson, Value & Knecht, 101 Park Ave., New York, Zone 17, engrs. CD 12/17.

▲† N. Y., Plattsburgh—SAC SPECIAL PACKAGE, etc.—BA 4/14—U. S. Eng., 111 E. 16 St., New York, SAC special package and ammo storage, FY 55, Plattsburgh Air Force Base. $1,000,000-$3,000,000. Extended date. CD 12/17.

† N. Y., Syracuse — OPERATIONAL FACILITIES — BA 4/27—U. S. Eng., 111 E. 16 St., New York, Zone 3, operational facilities, FY 55, Air National Guard, Hancock Field. $100,000-$500,000. Mayer & Whittlesey, 31 Union Square West, New York Zone 3, archts. CD 1/14.

† N. Y., Plattsburgh—REHABILITATION—BA 4/28—U. S. Eng., 111 E. 16 St., New York, Zone 3, rehabilitation, Phase I, Plattsburgh Air Force Base. $500,000-$1,000,000. Urbahn, Brayton & Burrows, 654 Madison Ave., New York, Zone 21, archts. CD 7/16.

▲† N. Y., Rome—ELECTRIC STORAGE SHOPS—BA 5/5—U. S. Eng., 111 E. 16 St., New York, Zone 3, ground electric storage shops, AMC, FY 53, Griffiss Air Force Base. $1,000,000-$3,000,000. Greenberg & Ames, 303 Fourth Ave., New York, Zone 10, archts. CD 10/22.

† N. Y., Rome—FACILITIES—BA 5/12—U. S. Eng., 111 E. 16 St., New York, Zone 3, NAVARHO facilities, structures, FY 55, Griffiss Air Force Base. $500,000-$1,000,000. Extended date. Wilcox & Erickson, 11 E. 44 St., New York, Zone 17, engrs. CD 12/16.

† N. Y., Plattsburgh—REHABILITATION—BA 6/28—U. S. Eng., 111 E. 16 St., New York, Zone 3, addnl. rehabilitation, Phase II, Plattsburgh Air Force Base. $500,000-$1,000,000. Urbahn, Brayton & Burrows, 654 Madison Ave., New York, Zone 21, archts. CD 7/16.

BIDS ASKED—BUILDINGS

▲ N. J., Freehold—SCHOOL—BA 3/15—Regional Bd. Educ., Freehold, high school on 28 acre tract on Herbertsville Rd. $1,500,000. Micklewright & Mountford, 72 Ewing St., Trenton, archts.

▲ N. J., Mount Holly—OFFICE, etc.—BA 3/15—Bd. Freeholders Burlington Co., Mt. Holly office and jail. $1,000,000. Petty & Croft, Moorestown, and Micklewright & Mountford, 72 Ewing St., Trenton, archts. CD 1/20.

† N. Y., West Point—AIR-CONDITIONING—BA 5/12—U. S. Eng., 111 E. 16 St., New York, Zone 3, air-conditioning gymnasium and theatre, FY 55, U. S. Military Academy. $100,000-$500,000. Zimmerman Eng. Co., 500 Fifth Ave., New York, Zone 18, archt. CD 10/10/46.

† N. Y., Schenectady—TRAINING CENTER—BA 5/19—U. S. Eng., 111 E. 16 St., New York, Zone 3, 600-man unit, Army Training Center, FY 53. $100,000-$500,000. Robert A. Green, Tower Hill, Tarrytown, archt. CD 12/17.

▲† N. Y., Watervliet—REHABILITATION BLDGS.—BA 6/14—U. S. Eng., 111 E. 16 St., New York, Zone 3, rehabilitation buildings, FY 55, Watervliet Arsenal. $1,000,000-$3,000,000. Sargent, Webster, Crenshaw & Folley, 310 Natl. Bank Bldg., Watertown, archts. CD 4/21.

▲† N. Y., Watervliet—BOILER PLANT—BA 6/23—U. S. Eng., 111 E. 16 St., New York, Zone 3, boiler plant rehabilitation, FY 55, Watervliet Arsenal. $1,000,000-$3,000,000. Krey & Hunt, 129 E. 45 St., New York, Zone 17, engrs. CD 4/21.

SOON LETS CONTRACT—BUILDINGS

Pa., Ardmore—CLUB—J. Bedford Wooley, archt., 1935 Chestnut St., Phila., soon lets contract club bldg. and parking area for Young Men's Christian Assn., 63 W. Lancaster Ave., Ardmore, Pa., and 1421 Arch St., Phila., Pa. $700,000. Stevens & Bruder, Lewis Tower Bldg., Phila., engrs. CD 11/8.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† Jack and Jim Maser, Inc., Brownstown, Pa., LB $990,900, excavation of approx. 2,000,000 cu. yd. glacial till for Robinson Bay Lock, approx. 3½ mi. northeast of Massena, St. Lawrence Seaway, St. Lawrence River. Contr. No. 2, CIVENG-30-023-55-40 (for the St. Lawrence Seaway Development Corp.) St. Lawrence Co., NEW YORK. U. S. Eng., Niagara and Bridge Sts., Buffalo, N. Y. Bids Feb. 3. CD 1/6.

▲† Arthur Venneri Co., 300 North Ave. E., Westfield, N. J., CA $3,580,261. constr. buildings, FY 55, Plattsburgh Air Force Base, PLATTSBURGH, N. Y. U. S. Eng., 111 E. 16 St., New York 3, N. Y. Bids Jan. 18. CD 1/21, under LB.

▲ NEW JERSEY, PENNSYLVANIA—Delaware River Port Auth., Administration Bldg., Bridge Plaza, Camden, N. J.,

Union Bldg. & Constr Corp., 631 Main St., Passaic, N. J. CA, $1,543,025, Contract G-3, stringer spans substructure from Newton Creek to North-South Freeway of bridge over Delaware River connecting Packer Ave., Phila., Pa. and Gloucester, N. J. Bids Feb. 10, awarded Feb. 16. CD 1/21.

NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton,

Gallo Asphalt Co., 1000 Springfield Ave., Irvington, N. J., LB, $646,430, widn. pavement 3.468 mi. Section 20 of Route 27, from Woodbridge Ave. to Bridge St., Highland Park and Metuchen, Middlesex Co. Bids Feb. 15. CD 1/27.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Hyman Rosen & Son, c/o Long Island Homes, 168-12 Hillside Ave., Jamaica 32, N. Y. Owner Builds. $3,000,000. 187 HOUSES, 45-acre tract, S. Main St., west of Rte. 110, FARMINGDALE, N. Y.

John Kinner & Assocs., Inc., P. O. Box 180, Corning, N. Y. LB $809,000, est. $800,000. Community HOSPITAL Bldg., NEWARK, N. Y. Newark-Wayne Hospital, Inc., Newark, N. Y. Waasdrop & Northup, 311 Alexander St., Rochester, N. Y., archts.

▲ Driscoll-Moccia Constr. Co., 41 E. 42 St., New York 17, N. Y., LB $7,411,711, general constr.;

Afgo Engr. Corp., 475 Adelphi St., Brooklyn 17, N. Y. LB $893,000, heating and ventilating;

Lipsky & Rosenthal, Inc., Lexington Ave. and 115 St., New York 29, N. Y. LB $907,770, plumbing;

E. A. Kahn & Co., Inc., 163-18 Jamaica Ave., Jamaica, N. Y., LB $600,000. electrical work for Robert F. Wagner, Sr. HOUSES (Proj. No. NY-5-24). Sect. I, incl. Bldg. Nos. 1 through 13 (inclusive) in area bounded by a proposed new street, Franklin D. Roosevelt Dr. E. 120 St. and 1st Ave., Manhattan Boro, NEW YORK, N. Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y. Starrett & Van Vleck, 267 Fifth Ave., New York 16, N. Y. archts., Reginald E. Marsh, 101 Park Ave., New York, N. Y., assoc. archt. Bids Feb. 15. CD 2/9.

▲ Fisher Bros., 120-44 Queens Blvd., Kew Gardens, N. Y. Owner Builds. $4,000,000. 20 story APARTMENT, 50 Sutton Place South from 54 to 55 Sts., NEW YORK, N. Y. Lawrence M. Rothman, 147 E. 125 St., New York, N. Y., archt. CD 1/3.

Turner Constr. Co., 420 Lexington Ave., New York 17, N. Y. and G. D. Campbell Building Co., Inc., 39 Cannon St., Poughkeepsie, N. Y. CA $900,000. two 2 story LABORATORY BLDGS., adjoining Research Laboratory, POUGHKEEPSIE, N. Y. International Business Machines Corp., 590 Madison Ave., New York 22, N. Y. Eliot Noyes & Assocs., 85 Main St., New Canaan, Conn., archts. Seelye, Stevenson, Value & Knecht, 101 Park Ave., New York 17, N. Y. engrs.

▲ Girsh Moss Inc., 1325 Walnut St., Phila., Pa., Separate Contracts, $1,430,000, 110-unit RESIDENTIAL DEVELOPMENT, Route 70 and Brace Rd., ERLTON, N. J. Earling H. Wenge, McClatchy Bldg., Upper Darby, Pa., archt.

Rudolph Friedman, 1255 Greeley St., Phila., Pa., Separate Contracts, $500,000 43-unit RESIDENTIAL DEVELOPMENT, Dixon St., PALMYRA, N. J. Dante J. D'Anastasio, 1815 Federal St., Camden, N. J., archt.

Dulane Builders, Inc., 7178 Lee Ave., Pennsauken, N. J. CA, $692,000, 48-unit RESIDENTIAL DEVELOPMENT, 41 St., PENNSAUKEN, N. J. Girsh Moss, Inc., 1325 Walnut St., Phila., Pa. Erling W. Wenger, McClatchy Bldg., Upper Darby, Pa., archt.

▲ Girsh Moss, Inc., 1325 Walnut St., Phila., Pa., Separate Contracts. $1,430,000. RESIDENTIAL DEVELOPMENT, Penn Valley Ave., BRISTOL, PA. Erling H. Wenge, McClatchy Bldg., Upper Darby, Pa., archt.

A. A. LaFountain, Inc., 161 Beech St., Hackensack, N. J., CA $860,000, 4 story TELEPHONE EXCHANGE, 183-187 Broad St., RED BANK, N. J. New Jersey Bell Telephone Co., 540 Broad St., Newark, N. J. Voorhees, Walker, Smith & Smith, 101 Park Ave., New York 17, N. Y., archts.

▲ The Nicholson Co., Inc., 10 Rockefeller Plaza, New York 20, N. Y., CA $2,300,000. demolish OPEN HEARTH BLDG. No. 1, constr. new OPEN HEARTH BLDG. No. 1, BETHLEHEM, PA. Bethlehem Steel Corp., 25 Broadway, New York 4, N. Y.

Sessinghaus & Ostergaard, Inc., 1115 Peach St., Erie, Pa., CA $565,000, est. $723,422, 2 story, bsmnt. 80x160 ft., brick, block, steel INSURANCE OFFICE BLDG., ERIE, PA. Erie Insurance Exchange, 6 and French Sts., Erie, Pa. Bids Feb. 1. CD 1/19.

▲ Ralph M. Parsons Co., 617 S. Olive St., Los Angeles, Calif., CA Est. $15,000,000. 2 CRUDE OIL STILLS, MARCUS HOOK, PA. Sinclair Refining Co., 600 Fifth Ave., New York, N. Y. and Marcus Hook, Pa. C. Weber, c/o owner, ch. engr.

▲ Lincoln Homes Co., 500 N. 63 St., Phila. Pa. Separate Contracts. $1,250,000. RESIDENTIAL DEVELOPMENT, NORRISTOWN, PA.

▲ The Trimble Co., 1719 Penna Ave., Pittsburgh, Pa. CA Est. $2,500,000. superstructure for 3 and 4 story, 150x150 ft., stone, steel SCIENCE BLDG. (Clapp Hall), PITTSBURGH, PA. University of Pittsburgh, 5th Ave. and Bigelow Blvd., Pittsburgh, Pa. Trautwein & Howard, 1411 Walnut St., Phila., Pa., archts. CD 12/16/49.

▲ Rodger Constr. Co., 520 Moeden Rd., Huntingdon Valley, Pa., Separate Contracts. $7,500,000. 500 RESIDENCES, Street Rd., WARMINSTER, PA.

▲ Rodgers Constr. Co., 520 Moeden Rd., Huntingdon Valley, Pa. Separate Contracts. $2,000,000. 200 RESIDENCES, East County Line Rd., WARMINSTER, PA.

▲ Lav-Rock Manor, Inc., 8101 Gilbert St., Phila. Pa. Separate Contracts. $1,600,000. 80 RESIDENCES, Lav-Rock Hills, WYNCOTE, PA.

Devonshire Homes, Inc., 316 Wildel Ave., Wilmington, Del. Separate Contracts, $600,000. RESIDENTIAL DEVELOPMENT, Fairfax Section various locations of Northern Section, WILMINGTON, DEL.

Eugene P. Solge, 110 Fairfax Dr., Wilmington, Del., Separate Contracts, $500,000. RESIDENTIAL DEVELOPMENT, Fairfax Section, WILMINGTON, DEL.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
March 2 Louisiana
STREETS AND ROADS
March 2 Louisiana

BIDS ASKED—BUILDINGS

▲ Miss., Meridian—PLANT—BA 3/15—Simpson Coal & Chemical Corp., c/o Standard Ore & Alloys Corp., 120 Wall St., New York, N. Y., chemical plant to produce acetylene, anhydrous, ammonia and PVC, $20,000,000.

Va., Lynchburg—DORMITORY—BA 3/30—Lynchburg Young Womens Christian Assn., M. L. Driskill, exec. secy., Lynchburg, Y.M.C.A. Dormitory. $600,000. Pendleton S. Clark, Krise Bldg., archt. CD 3/10/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† VIRGINIA—Bureau P. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington,

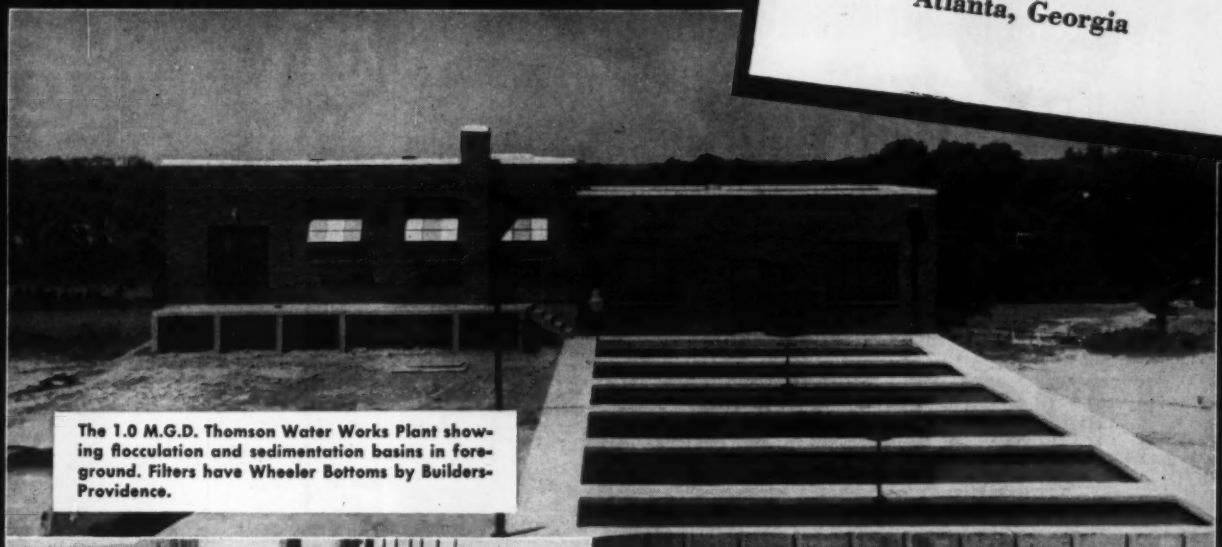
A. B. Burton Co., Inc., Wards Rd., Lynchburg, Va., CA, $824,068. grading, 5 bridges, base course, etc. from Otter Creek Bridge No. 2 to James River, Blue

(Continued on page 74)

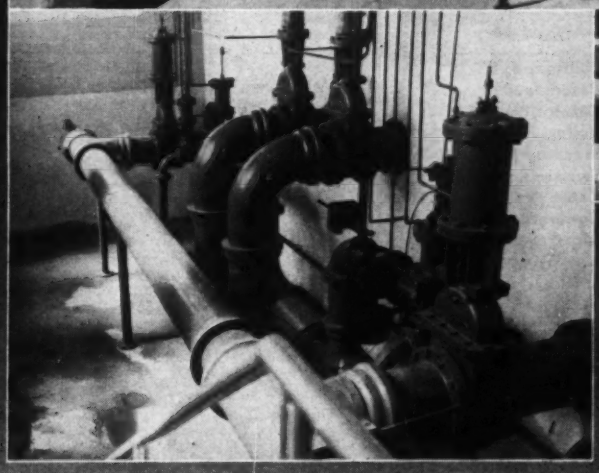
THOMSON, GEORGIA

Water Works Plant (Completed in 1953)

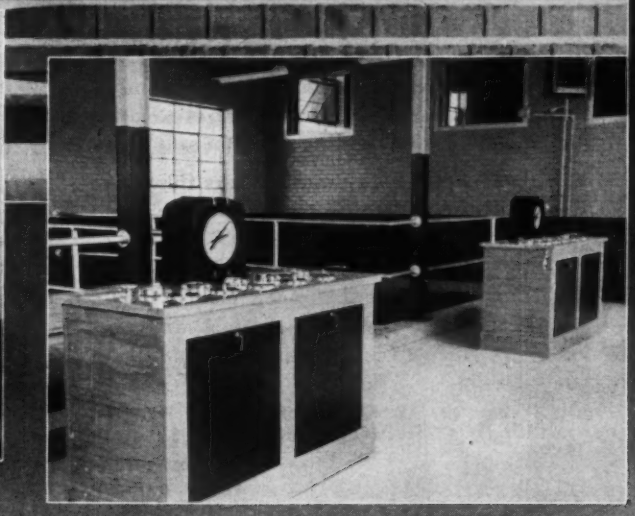
WIEDEMAN & SINGLETON
Engineers
Atlanta, Georgia



The 1.0 M.G.D. Thomson Water Works Plant showing flocculation and sedimentation basins in foreground. Filters have Wheeler Bottoms by Builders-Providence.



Builders Model RCE Controllers in this neatly designed pipe gallery automatically maintain constant flow through filters.



Builders Filter Valve Operating Tables with Loss of Head and Rate of Flow Gauges for convenient control of each filter.

Industrially speaking, Georgia is one of the fastest growing States in the East. To take care of a present population of 5000 and to be prepared for further expansion, the city of Thomson recently completed this fine new water works. Construction, by Sullivan, Long & Hagerty of Birmingham, has resulted in a small plant that's "big league" in every respect, employing the same type of instrumentation and controls used in many of the largest filtration plants for low cost and accurate operation.

For Bulletins describing Builders Water Works Equipment installed at the Thomson Water Works Plant, address Builders-Providence, Inc. (Division of B-I-F Industries, Inc.), Providence, Rhode Island.

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BUILDERS IRON FOUNDRY • PROPORTIONERS, INC. • OMEGA MACHINE CO.

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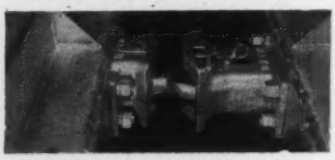

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Lancaster, Pa.

Diamond Core Drilling

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for Foundations, Dams, Bridges and all Heavy Structures
GROUT HOLES

Tinney Drilling Co.
Grafton, W. Va.

(Continued from page 72)

Ridge Parkway, Proj. 1G3. Amherst Co. Bids Jan. 21, awarded Feb. 11. CD 1/25 under LB.

▲† **Ballenger Paving Co.**, P.O. Box 927, Greenville, S. C. CA $4,194,005, airfield paving, Hunter Air Force Base, ENG-09-133-55-21, SAVANNAH, GA. U. S. Eng., 200 E. St. Julian St., Savannah, Ga. Bids Jan. 6. CD 1/20, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **Virginia Eng. Co., Inc.**, 29 St. at James River, Newport News, Va., CA $1,647,000. AMMUNITION STORAGE FACILITIES, Skiffe's Creek Annex, Naval Mine Depot, (nine new bldgs., rehabilitation of one bldg.). NOY 85887, Spec. 43074, YORKTOWN, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va. Bids Feb. 8, awarded Feb. 11. CD 2/14, under LB.

▲ **Daniel Constr. Co.**, 429 N. Main St., Greenville, S. C., CA Est. $1,000,000. 100,000 sq. ft. plant mfg. plastic bags for packaging meats, poultry and cheese, near Greenville, SIMPSON, S. C. Dewey & Almy Chemical Co., 62 Whittemore Ave., Cambridge, Mass.

▲ **Beers Constr. Co.**, 70 Ellis St. N.E., Atlanta, Ga. CA, $2,297,162, OFFICE, 1699 Peachtree Road N.W. ATLANTA, GA. Retail Credit Co., 90 Fairlie St. N.W. Atlanta, Ga. Cooper, Barrett, Skinner, Woodbury & Cooper, Henry Grady Bldg., Atlanta, Ga., archts.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **Ind., Anderson** — SCHOOL — BA 3/15 — Anderson Twp. Holding Corp., 520 W. 11 St., Township Junior and Senior High School. $1,500,000. Plans deposit $50. Miller & Henning, Anderson Bank Bldg., archts. CD 1/14.

Ind., Kokomo—SCHOOLS—BA 3/25—School City of Kokomo, 2 new elementary schools $800,000. Perkins & Will, 309 W. Jackson Blvd., Chicago, Ill., archts. CD 11/17.

O., Columbus—LAW—BA 3/31—Ohio State University, N. High St., 3 story, brick law bldg. $750,000. CD 11/16.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Milbourn Brothers Co.**, Crystal St., Mount Prospect, Ill., LB, $1,053,873, paving Congress Expressway from Cierco to Kostner Aves.;

Charles J. Wilson Co., 7601 S. Wentworth St., Chicago, Ill., LB $728,732, Calument Expressway grading near Chicago Heights, CHICAGO, ILL. Cook Co., County Bldg., Chicago, Ill. Bids Feb. 7. CD 1/28.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Caserta Development Co.**, 100 East Broadway, Alliance, O. Own Forces. $3,500,000. PLANT and OFFICE, ALLIANCE, O. Miller Mfg. Co., 5919 Tireman St., Detroit, Mich., lessee.

Joseph Skilken & Co., 383 S. 3 St., Columbus, O., CA $867,593, 400 ft. indoor practice bldg. for track, baseball, etc., FIELDHOUSE, west side St. John Sports Arena, COLUMBUS, O. Ohio State University N. High St., Columbus, O. Bids Jan. 18. CD 2/4, under LB.

B-Z Homes, Inc., Greenwood, Ind. Owner Builds. $400,000 new group of HOMES, GREENWOOD, IND.

Grinslade Krabenhoff Co., 219 E. Ohio St., Indianapolis, Ind. Owner Builds. $550,000 HOMES, 14 and Arlington Sts., INDIANAPOLIS, IND.

▲ **The Lux Agency**, 654 Main St., Lafayette, Ind. Owner Builds. $1,000,000, 70 HOMES, mostly in western section, LAFAYETTE, IND.

▲ **Sollitt Constr. Co.**, 301 Columbia St., South Bend, Ind., CA, $1,000,000, 1 and 2 story, bsmnt., 282x179 ft. FINE ARTS BLDG., SOUTH BEND, IND. St. Mary's College, South Bend, Ind. Bids Jan. 5, awarded Feb. 7. CD 12/17.

▲ **Corbetta Constr. Co.**, 208 S. La Salle St., Chicago 4, Ill., LB, $7,988,700, Cabrini Extension HOUSING, CHICAGO, ILL. Chicago Housing Auth., 608 S. Dearborn St., Chicago 5, Ill. Bids Feb. 1. CD 12/30.

▲ **Finitzo Brothers, Inc.**, 5444 Archer St., Chicago, Ill., Own Forces, $2,000,000, 160 HOMES, 47 St. from Cicero to Laramie Aves., also on Archer Ave., CHICAGO, ILL. M. J. McCarthy, 6201 S. Washtenaw St., Chicago, Ill., archt.

▲ **J. Emil Anderson & Son**, 1809 W. Balmoral St., Chicago, Ill., CA, $1,500,000. 175,000 sq. ft. WAREHOUSE, OFFICE, 47 and Kilbourn Sts. CHICAGO, ILL. John Sexton & Co., 500 North Orleans St., Chicago, Ill.

▲ **Red Seal Homes, Inc.**, 188 W. Randolph St., Chicago 1, Ill. Own Forces. $1,200,000. 60 HOMES in area of Oak Knolls Golf Course, near LAKE FOREST, ILL.

▲ **Paul H. Schwenderer**, 7553 S. Chicago Ave., Chicago, Ill. Own Forces. $7,000,000, 600 HOMES, also sewer lines, near Wolf Rd. and 49, 50, Willow Springs Rd. and 55 Sts., near WILLOW SPRINGS, ILL.

▲ **B. Perini & Son**, 73 Montwait Ave., Framingham, Mass., LB, $4,412,424, general contract COURT HOUSE—CITY HALL, MADISON, WIS. City, City Hall, and Dane Co., Court House, Madison, Wis. Bids Feb. 10. CD 12/29.

▲ **Slavik Builders**, 20063 James Couzens St., Detroit, Mich. Owner Builds. $3,900,000. 350 brick HOMES, ANN ARBOR, MICH.

▲ **Christman Co.**, 408 Kalamazoo Bldg., Lansing, Mich. LB $5,013,000. 3 DORMITORY UNITS, Michigan State College, EAST LANSING, MICH. State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, Mich. Bids Feb. 9. CD 1/24.

▲ **Slavik Builders, John F. Slavik**, 20063 James Couzens St., Detroit, Mich. Owner Builds. $1,700,000. 150 brick HOUSES, Marquette and Middlebelt Section, GARDEN CITY, MICH.

▲ **Mount Vernon Motels, Inc.**, H. J. McCormick, Roosevelt Hotel, Lansing, Mich. Owner Builds. $1,250,000. 4 unit MOTEL each unit 31 sections, also 25x60 ft. swimming pool, LANSING, MICH.

▲ **Lytle Constr. Co.**, 7742 Greenfield St., Dearborn, Mich. Owner Builds. $3,000,000. Ann Arbor Trail Subdivision 250 brick HOMES 4 units used as schools, LIVONIA, MICH.

▲ **Rose-Hill Builders**, 13324 W. 7 Mile Rd., Detroit, Mich. Owner Builds. $1,250,000. 100 brick ranch HOUSES, Devonshire Park, Henry Ruff Rd., Milburn St., LIVONIA, MICH.

▲ **Beaufait Realty Co.**, J. J. Beaufait, 20502 Harper St., Harper Woods 36, Mich. Owner Builds. $2,250,000. 200 brick HOMES, Shady Lane Dr., Eight Mile and Harper Section, ST. CLAIR SHORES, MICH.

▲ **David Kay, (Builder)**, 10051 Southfield St., Detroit 28, Mich. Owner Builds. $5,000,000. 400 brick HOUSES, Harvard, Port and Masonic Sts., ST. CLAIR SHORES, MICH.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

March 3, 8 Kansas

STREETS AND ROADS

March 1 Colorado — March 3, 8 Kansas

March 11 Minnesota

▲† **South Dakota**—BA On Or About 5/17—U. S. Eng., 1709 Jackson St., Omaha 2, Neb., constr. outlet works, Stage III, downstream tunnels, Oahe Reservoir Proj., Missouri River Basin Proj., Inv. CIVENG-25-066-55-89. CD 5/25/44.

BIDS ASKED—BUILDINGS

Minn., Duluth—SCHOOL—BA 3/2—Bd. Educ., H. J. Forsberg, clk., A. J. Ward, ch. engr., 4 story Washington Junior High School addn., Third St. $700,000. H. S. Starin & Assoc., 307 Sellwood Bldg., Duluth, archts. CD 2/2.

▲ **Ia., Sioux City**—Y.M.C.A.—BA 3/3—Young Men's Christian Assn., 701 Pierce St., Y.M.C.A. Bldg. $1,150,000. Wm. Beuttler, 405 Insurance Exchange Bldg., archt. CD 2/26/53.

▲ **Tex., Midland**—PLANT—Bids Asked—Cities Service Oil Co., Midland Tower Bldg., and Forest Oil Corp., 522 W. Ohio St., gas grocessing plant, $6,837,000; water sys., $45,000; gas lines in vicinity of plant, $110,000, near here. CD 1/11.

SOON LETS CONTRACT—BUILDINGS

Minn., St. Paul—SHOP and GARAGE—Twin City Rapid Transit Co., 1 S. 11 St., Minneapolis, soon lets contract 180,000 sq. ft. shop and garage, St. Anthony Ave. and Snelling Ave. North, alterations to existing bldgs. $800,000. L. B. Abbett, 1409 Willow St., Minneapolis, archt. CD 12/3.

Tex., Houston—SHOPPING CENTER—Center, Inc., c/o J. C. Epps, Jr., 12157 Kathryn Court, soon lets contract shopping center, $850,000. Arne G. Engberg, 2130 Welch St., archt. Walter P. Moore, 2 Pinedale St., B. Johnson & Assocs., 4926 Travis St., engrs. CD 2/2.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Union Pacific R. R. Co.**, W. C. Perkins, ch. engr., 1416 Dodge St., Omaha, Neb. Owner Builds, $2,500,000. tracks, relocating tracks, diesel service shop, constr. westbound freight forwarding yard in railroad yards, COUNCIL BLUFFS, IA.

MISSOURI—State Hy. Dpt., Jefferson City,
Union Constr. Co., 1401 Fairfax Trafficway, Kansas City, Kan. CA $947,914. six bridges, Livingston Co. CD 2/4, under LB.

▲ **MISSOURI**—State Hy. Dpt., Jefferson City, Mo. Own Forces. $1,370,299. oil tr. 151 mi. District No. 1; oil tr. 115 mi. District No. 2; oil tr. 90 mi. District No. 3; oil tr. 181 mi. District No. 4; oil tr. 120 mi. District No. 5; oil tr. 52 mi. District No. 6; oil tr. 102 mi. District No. 7; oil tr. 72 mi. District No. 8; oil tr. 58 mi. District No. 9; oil tr. 167 mi. District No. 10, various counties. Bids Jan. 28, awarded Feb. 10. CD 1/12.

▲ **Dickman-Pickens-Boyd Co.**, Manhattan Bldg., Muskogee, Okla., LB $1,249,274, est. $1,225,000. 104-room lodge and cabins, Sequoyah Park on Fort Gibson Lake, Wagoner Co., OKLAHOMA. Planning & Resources Bd., Capitol Bldg., Oklahoma City, Okla. Bids Feb. 11. CD 2/2.

▲ **Pelphrey-Basham, Inc.**, 1412 Electric Bldg., Fort Worth, Tex., CA $1,283,137, laying water line between three towns, Contrs. A, B, and C, GRAND PRAIRIE, IRVING, DALLAS, TEX. Cities of Grand Prairie, Irving and Dallas, c/o mayors, Grand Prairie, Irving and Dallas, Tex. Homer A. Hunter, 3708 Abrams Rd., Dallas, Tex., engrs. CD 11/15.

† **Vowell Constr. Co.**, Box 253, El Paso, Tex., CA $537,627, est. $200,000-$375,000. runway, primary widen, incl. 160,000 cu. yd. excav., 157,000 cu. yd. sub-

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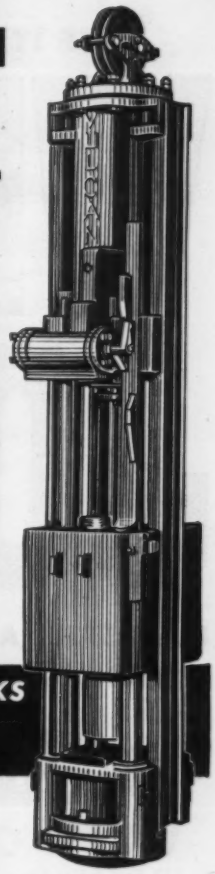

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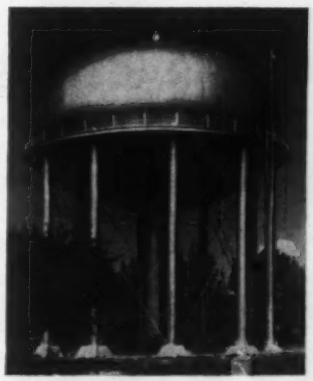

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grade preparation, 40,000 cu. yd. base course; 153 sq. yd. 4 in. hot mix; 150,000 sq. ft. airfield markings, lighting airfield, storm drainage, paving, Biggs Air Force Base, ENG-29-005-55-59, EL PASO, TEX. U. S. Eng., Box 1538, Albuquerque, N. M. Bids Feb. 9. CD 2/1.

City P. Service Bd., 201 N. St. Marys St., San Antonio, Tex. Own Forces. $575,000, electric power plant improvs. at Mission Station; $150,000, some improvs. and expansion existing main gas plant; $200,000, addnl. electric power lines to subdivisions, SAN ANTONIO, TEX. Grand total $925,000. CD 1/3.

▲ **Union Pacific R. R. Co.**, W. C. Perkins, ch. engr. 1416 Dodge St., Omaha, Neb. Owner Builds, $9,000,000. centralized traffic control 214 miles, from Granger, Wyo. to Pocatello, Idaho and between Moyer Junction and Fossil, Wyo., WYOMING and IDAHO.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **R. K. & A. Jones, Inc.**, 7129 Olive Blvd., University City 24, Mo. CA Est. $5,000,000. SHOPPING CENTER, incl. 25 stores, supermarket, department, drug, etc., parking area, group of homes on 53 acre tract fronting north side of 9000 block of Natural Bridge Rd., ST. LOUIS COUNTY, MO. Louis C. Lochmoeller, promotional agt., 4733 Natural Bridge Ave., St. Louis 15, Mo. Arthur B. Rathbert, 308 S. Grand Blvd., St. Louis 3, Mo.

J. E. Williams Constr. Co., 6490 Page Ave., St. Louis 14, Mo. CA $550,000. 1 and 2 story, 40,000 sq. ft. HIGH SCHOOL; 1 story, 10,000 sq. ft. ELEMENTARY SCHOOL in Troy; addn., alterations to ELEMENTARY SCHOOL, Moscow Mills, TROY, MO. Reorganized School Dist. No. R-3, Claude Brown, supt. Schools, High School, Troy, Mo. CD 1/21, under LB.

▲ **M. W. Kellogg Co.**, 225 Broadway, New York, N. Y., CA $2,500,000. 7,000 bbl. DE-COKING unit at West Tulsa Refinery, TULSA, OKLA. Mid-Continent Petroleum Corp., Mid-Continent Bldg., Tulsa, Okla. Awarded Feb. 1.

McGuire Constr. Co., Box 2196, Abilene Tex. CA $614,332, HIGH SCHOOL, BIG LAKE, TEX. Reagan County School Bd., Independent School Dist., Big Lake, Tex. Bids Dec. 14. (Correction—contractor). CD 12/29, under CA.

Tips Investment Co., 701 Forest Ave. Rd., Dallas, Tex. Owner Builds. $750,000. (B) 100 APARTMENT units, DALLAS, TEX. CD 5/4.

▲ **Roy E. Harris**, Contractor, 3407 Rice St., Houston, Tex., CA $398,118, 14 DWELLINGS; CA $604,725, 19 DWELLINGS, HOUSTON, TEX. S. D. Constr. Co., 2420 Holcombe St., Houston, Tex. CD 1/17.

Jack R. Little, 1202 Ogilvie St., Houston, Tex. CA $668,150, Group 3, 20 DWELLINGS; Group 4, 23 DWELLINGS, HOUSTON, TEX. G. M. DeGeorge & Assocs., Melrose Bldg., Houston, Tex. CD 12/22.

Miles Strickland, 2802 Louisiana St., Houston, Tex. Force Account. $696,150, 28 DWELLINGS, 38 DWELLINGS, HOUSTON, TEX. CD 12/22.

▲ **H H. Moeller**, Box 35, Grayston St. Station, San Antonio, Tex., CA $2,263,889, HOSPITAL, LAREDO, TEX. Sisters of Mercy, c/o Mercy Hospital, Laredo, Tex. Bids Jan. 11. CD 1/25, under LB.

Green Meadows Development Co., Inc., 3800 San Pedro St., San Antonio, Tex. Owner Builds. $610,000. (E) 27 DWELLINGS, (F) 27 DWELLINGS, SAN ANTONIO, TEX. CD 11/8.

▲ **Southwestern Properties, Inc.**, Seagoville, Tex. Owner Builds. $1,036,700, Group 7, 29 DWELLINGS; Group 8, 34 DWELLINGS; GROUP 9, 33 DWELLINGS, SEAGOVILLE, TEX. CD 11/24.

Lembke, Clough & King, Inc., Box 455, Albuquerque, N. M. LB $625,682. est. $600,000. 400 ft. long, 52-bed brick, concrete HOSPITAL, CARLSBAD, N. M. Carlsbad Community Hospital, Carlsbad, N. M. Bids Feb. 4. CD 1/26.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
March 9, 17 California

▲ **Wash., Tacoma**—BA 3/8—Pierce Co., County Court House clearing site for County-City Bldg. Total Est. $6,000,000. Plans deposit $35. A. G. Lumm, 321 S. 11 St., archt. CD 5/28/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

J. K. Thayn, 2021 E. 2700 South St., Salt Lake City, Utah, LB $625,000, sanitary sewerage sys., Midvale, SALT LAKE CITY, UTAH. Salt Lake Suburban Sanitary Dist. No. 2, City-County Bldg., Salt Lake City, Utah. Caldwell, Richards & Sorensen, 408 Zion Saving Bank Bldg., Salt Lake City, Utah, engrs. Bids Feb. 1.

WASHINGTON—State Hy. Comn., Olympia,
F. H. Slate Co., Oregon Ltd. & E. C. Hall Co., 7805 S. W. 40 Ave., Portland, Ore., CA $524,648, clearing, draining, grading, surf., paving 2.553 mi. Primary State Hy. 12-K-M. Mountain westerly, Wahkiakum Co. Bids Feb. 1. CD 2/7, under LB.

† **R. E. McKee General Contractor, Inc.**, 4701 San Fernando Rd. West, Los Angeles, Calif., CA $918,555. hangar and other bldgs. at International Airport, Schedule A, Inv. 55-81, PORTLAND, ORE. U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash. Bids Dec. 21. CD 12/30, under LB.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,

Madonna Constr. Co., 399 Freeway, San Luis Obispo Calif., CA $2,964,679, grading, paving, 6 bridges 9.3 mi. between Santa Margarita and Atascadero, San Luis Obispo Co. Bids Jan. 12, awarded Jan. 28. CD 1/21, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Griffith Co., 1060 S. Broadway, Los Angeles, Calif., CA, $2,817,519, grading, surf. bridges 2.7 mi. Santa Ana Freeway between Lewis St. and Broadway, Orange Co.

Daley Corp., P. O. Box 4067, San Diego, Calif., CA $609,849, grading, surf. 3.5 mi. Alvarado Canyon Rd. and Brockton St., San Diego Co. Bids Jan. 20. CD 1/28, under LB.

CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles,

Matich Bros. & Matich Bros. Paving Co., P.O. Box 390, Colton, Calif., CA, $748,257, grading, surf. 5.2 mi. between Marino and Jct. of Rt. 26, Riverside Co. Bids Jan. 27, awarded Feb. 10. CD 2/2, under LB.

▲ **CALIFORNIA**—State Div. Hys. P. Wks. Bldg., Sacramento,

Piombo Constr. Co., P.O. Box 935, San Carlos, Calif., CA, $2,314,554, grading, surf., steel plate girder bridge 4 mi. between Vollmers and Lamoine, Shasta Co. Bids Jan. 26, awarded Feb. 8. CD 2/2, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Winston Brothers Co., 1532 S. California Ave., Monrovia, Calif., LB, $2,210,075, grading, paving 1 bridge, 2 undercrossings 5.2 mi. between Citrus Ave. and Ganesha Blvd., Los Angeles Co. Bids Feb. 3. CD 1/21.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles

E. L. Yeager Co. & J. A. Payton, P.O. Box 87, Riverside, Calif., CA, $1,143,442, grading, surf. 11 mi. and 1 rein.-con. bridge between Jct. Rt. 78 and San Jacinto, Riverside Co. Bids Jan. 13, awarded Feb. 2. CD 1/21, under LB.

Valley Engineers, Inc., P.O. Box 412, Fresno, Calif., CA, $615,370, water mains, services, etc., EUREKA, CALIF. Humboldt Community Services Dist., 3750 Harris St., Eureka, Calif. Awarded Feb. 2. CD 9/28.

BUILDINGS

LOW BIDS AND CONTRACTS

Mardis Constr. Co., Walla Walla, Wash., LB $574,430. general contract 64,000 sq. ft. Garrison Junior High SCHOOL, WALLA WALLA, WASH. School District No. 110, Walla Walla, Wash. Bids Feb. 8. CD 1/21.

▲† **George A. Fuller Co.**, 3100 West 8 St., Los Angeles, Calif., LB $3,009,000. Canoga Park PROPULSION CENTER, CALIFORNIA. U. S. Atomic Energy Comn., 1901 Constitution Ave. N. W., Wash., D. C. North American Aviation, Inc., Downey, Calif. will operate. Bids Feb. 1. CD 7/15.

▲ **Hilp & Rhodes**, 16 and Kansas Sts., San Francisco, Calif., CA, $5,000,000, SHOPPING CENTER, Willow Pass Road Extension, CONCORD, CALIF. Concord Investment Corp., c/o Coldwell, Banker & Co., 425 15 St., Oakland, Calif. John Bolles, 918 Harrison St., San Francisco, Calif., archt.

▲ **W. E. Robertson**, 4015 W. Jefferson Blvd., Los Angeles, Calif., CA, $1,235,100, 79 frame, stucco DWELLINGS, Roberta, Baker and Houston Aves., FULLERTON, CALIF. Fullerton Park Homes, Inc., 4015 W. Jefferson Blvd., Los Angeles, Calif. Max Maltzman, 4015 W. Jefferson Blvd., Los Angeles, archt.

▲ **W. E. Robertson**, 4015 W. Jefferson Blvd., Los Angeles, Calif., CA, $1,185,000, 99 frame, stucco DWELLINGS, Grove, Central and Chapman Aves., FULLERTON, CALIF. Cypress-Chapmen Park, Inc., 4015 W. Jefferson St., Fullerton, Calif. Max Matzman, 4015 W. Jefferson Blvd., Los Angeles, Calif., archt.

▲ **Robert E. McKee General Contractor, Inc.**, 4701 San Fernando Road West, Los Angeles, Calif., LB, $2,563,500, primary sewage treatment plant, SAN JOSE, CALIF. City, City Hall, San Jose, Calif. Bids Feb. 14. CD 12/27.

Utah Constr. Co., 100 Bush St., San Francisco, Calif., CA, $841,125, 83-bed HOSPITAL, UKIAH, CALIF. Mendocino Co., Court House, Ukiah, Calif. Bids Jan. 24, awarded Feb. 3. CD 2/2.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

Ont., Sarnia—BA 3/21—City, City Hall, storm sewers in various streets, $628,000. T. H. Dobbin, c/o owner, city engr. CD 3/6/53.

BIDS ASKED—BUILDINGS

Que., Montreal—APARTMENTS, etc.—Bids Asked—Dr. Jos. I. Bessette, c/o Roger A. Vandal, archt., 10867 St. Urbain St., 3 story, bsmnt., 35-suite apartment, incl. 34-car garage, St. Joseph St., in Lachine suburban area. $500,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

BRITISH COLUMBIA—B. C. Govt., Douglas Bldg., Victoria,
W. C. Arnett & Co. Ltd., Yale, B. C., LB $691,101 reconstr. 5.04 mi. Canoe-Sicamous Section Trans-Canada Hy. Bids Jan. 28. CD 1/20.

Standard Dredging Co., Burma Rd., East St. John, N. B. LB $512,620, transit sheds at Pugsley Terminal Wharf Exten., ST. JOHN, N. B. National Harbors Bd., Parliament Bldg., Ottawa, Ont. Bids Feb. 9. CD 1/25.

▲ **Provincial Engineering Ltd.**, 674 Ferguson Ave., Niagara Falls, Ont., CA $1,000,000, 41 steel towers for television relay stations from Toronto, Ont. to Winnipeg, Man. about 1,500 miles, ONTARIO-MANITOBA. Canadian Broadcasting Corp., 354 Jarvis St., Toronto, Ont. G. E. Hayes, c/o owner, 1425 Dorchester St. W., Montreal, Que., ch. engr. Awarded Feb. 9.

▲ **English Electric Co. Ltd.**, 2859 Dundas St. W., Toronto, Ont., CA, $7,500,000 16 turbines to drive 16 generators for International St. Lawrence Power Project at Cornwall, ONTARIO. Ontario Hydro-Electric Power Comn., 620 University Ave., Toronto, Ont. CD 10/26.

▲ **Canadian Westinghouse Co. Ltd.**, 286 Sandford St., Hamilton, Ont., CA $3,500,000, six 55,000 hp. motor generator units for pumped water storage project, Sir Aden Beck Generating Station, Niagara Falls, ONTARIO, Hydro-Electric Power Comn., 620 University Ave., Toronto, Ont. CD 9/5/50.

BUILDINGS

LOW BIDS AND CONTRACTS

Armstrong & Monteith Constr. Co., Ltd., 1449 Hornby St., Vancouver, B. C., CA, $675,000. 4 story, 78x100 ft., rein.-con. OFFICE, VANCOUVER, B. C. National Trust Co. Ltd., 811 W. Pender St., Vancouver, B. C. Awarded Feb. 4. CD 11/12.

▲ **Con-Eng. Constr. Co.**, Bank of Toronto Bldg., London, Ont. CA, $1,000,000, SHOPPING CENTER, incl. 1 story 140x150 ft., super-market for Grand Union-Carroll Stores, bank and 8 other bldgs., LONDON, ONT. L. L. Corley, 2 Harcroft Rd., Toronto 3, Ont. Hanks & Irwin, 2848 Bloor St. W., Toronto, Ont., archts. Awarded Feb. 14.

▲ **Owner**, c/o J. D. Jackson, Guthrie Bldg., Exmouth St. and Colbourne Rd., Sarnia, Ont. Owner Builds, $1,250,000, 100 HOUSING UNITS, in Coronation Park Area, SARNIA, ONT.

▲ **Principal Investments Ltd.**, 67 Richmond St. W., Toronto, Ont., Owner Builds, $2,500,000, 30 store SHOPPING CENTER, 2,000 car parking, incl. sewage disposal plant, on 28-acre site, LaSalle Blvd. and Barry Down Rd., SUDBURY, ONT.

▲ **Sanamo Constr. Co Ltd.**, 3014 Bathurst St., Toronto, Ont. Owner Builds, $1,368,000, APARTMENT, Mt. Pleasant Rd. north of Blythwood Rd., TORONTO, ONT. I. M. Saunders, 658 Spadina Ave., Toronto, Ont., archt. CD 2/16.

▲ **Meteor Homes Ltd.**, 800 Gordon Brown Bldg., Montreal, Que., Est. $1,700,000. housing, "Sun Valley HOMES", Lepage St., DORVAL, QUE. CD 2/7.

▲ **Lummaus Co. of Canada Ltd.**, 455 Craig St. W., Montreal, Que., CA est. $8,500,000 design and construct FACTORY St. Lawrence River at Contrecoeur, near MONTREAL, QUE. Quebec Ammonia Co. Ltd., c/o McDonald & Joyal Ltd., 1117 St. Catherine St. W., Montreal, Que. Awarded Feb. 10.

Parkside Development Corp., c/o H. M. Tolchinsky, archt., 4708 Van Horne Ave., Montreal, Que. Owner Builds, $600,000, 30 HOUSES near Louise Park in Ville St. Laurent, suburb, MONTREAL, QUE.

▲ **Riverside Housing, Inc.**, 5210 Van Horne Ave., Montreal, Que., Owner Builds, $1,600,000. SHOPPING CENTER and APARTMENT DEVELOPMENT in Ville La Salle suburb, MONTREAL, QUE. Ben-Ami Shulman, 5174 Cote des Neiges Rd., Montreal, Que., archt.

Ross & Anglin Ltd., 4400 St. Catherine St. W., Montreal, Que., CA $725,000. superstructure of new plant, St. Louis St., ST. JOHNS, QUE. Cables, Conduits & Fittings Ltd., 77 Richelieu St., St. Johns, Que., Meadowcroft & MacKay, 4115 Sherbrooke St. W., Montreal, Que.; archts. Awarded Feb. 10. CD 6/16.

▲ **J. M. E. Fortin**, 58 Dahlia Ave., Dorval, Que., Owner Builds, $2,000,000, HOUSING on new streets off Ste. Rose Blvd., STE. ROSE, QUE.

▲ **Bowman Corp. Ltd.**, 3454 St. Dennis St., Montreal, Que., CA, $3,700,000, 340-unit HOUSING DEVELOPMENT, Levesque Blvd., ST. VINCENT DE PAUL, Que. Pan American Construction Co., Ltd., 1082 Beaver Hall Hill, Montreal, Que. Thibodeau & Thibodeau, 1247 Guy St., Montreal, Que., archts. Awarded Jan. 25.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

† **Alaska, Petersburg**—BA 3/19—Town, Town Hall, 27x32 ft. rein.-con. or masonry power house, rock-fill or concrete arch dam, 5,000 ft. 20 and 14 in. penstock, 16.8 mi. 22,000-volt transmission line and control circuit. $750,000. Plans deposit $25. R. W. Beck & Assocs., Tower Bldg., Seattle 1, Wash., engrs. CD 8/21/53.

AMERICANS ABROAD

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Corsicia**—BA 4/11—Ministere des Forces Armees (Air) Service de l'Infrastructure, 26 Boulevard Victor, Paris, France, taxiways and aprons at Solenzara Airfield. $4,842,814. Project is under bidding procedure of NATO.

(Proposal Advertisements see pp. 85 to 87)

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How Prices Are Running on St. Lawrence Bids

Preliminary St. Lawrence Power Project contracts by New York State Power Authority include $5.2 million in bridges, $4 million in concrete aggregate, $1 million in road and rail and transmission line, $23.3 million in turbines and generators.

Praeger-Kavanagh, New York City, is consulting engineer for bridges. Uhl, Hall & Rich, Boston, is consultant for other St. Lawrence Power Project work.

A temporary steel truss, floating bridge over St. Lawrence River will connect Hawkins Point to Barnhart Island. Barnhart Island 3-span permanent bridge will run 1,073.5 ft between abutments from about 6 mi northeast of Massena, N. Y. to Barnhart Island. Award of substructures for both bridges was to A. S. Wikstrom on basis of tremie concrete and rockfill cofferdam alternates.

1C A. S. Wikstrom, Skaneateles, N. Y..... $2,046,369*
2 Walsh Const Co , New York, N. Y..... 2,277,354

Bids: 10-6-54 Items	Unit	Quantity	Unit Prices 1 C	2
Floating bridge:			$245,820	$257,978
Excavation	cy	3,500	6.00	7.50
Borrow	cy	1,400	5.00	3.50
Rockfill	cy	3,900	13.00	9.70
Riprap, dry	sy	700	6.00	7.40
Steel bearing piles	lf	1,820	7.00	8.00
Portland cement, type 2	bbl	2,640	6.00	7.20
Concrete, cl 1A	cy	1,650	70.00	80.00
Bar reinforcement	lb	72,000	0.17	0.20
Remove rock fill	cy	1,100	6.00	3.50
Compl dt: 12-15-54 Liq dam: $100 ea cal day to 3-1-55 $1,000 ea day beyond 3-1-55				
Barnhart I bridge:			1,880,549	2,019,376*
Total with intrusion concrete alternate				2,026,681
Excavation, abutment	cy	12,200	2.50	5.00
Gravel, run of bank	cy	700	4.50	7.00
Riprap, dry	sy	2,100	6.00	6.50
Excavation, piers	cy	4,300	5.00	9.30
Caissons	ls	....	950,000	727,000
alt rockfl coffe-dam	ls	....	870,000	....
Conc, pier fndn, tremie	cy	4,870	20.00	26.00
abutments	cy	3,410	40.00	70.00
pier shafts	cy	5,000	37.00	31.00
Bar reinforcement	lb	329,700	0.17	0.20
Portland cement, type 2	bbl	21,250	6.00	7.20
Air entraining agent	gal	200	1.75	2.00
Steel bearing piles	lf	10,400	10.00	11.60
Icebreakers	ls	....	75,000	208,926
Structural steel	lb	115,200	0.25	0.40
Wrought iron plates	lb	104,600	0.50	0.55
Concrete, intrusion, alt	cy	4,870	....	27.50

Compl dt: 6-15-55 Liq dam: $1,000 ea cal day
*Basis tremie conc & rockfill cofferdam

Mt. Vernon Bridge Co. will build Barnhart Island steel and concrete bridge superstructure to be ready for use by November 1955.

1C Mt. Vernon Bridge Co., Mt. Vernon, Ohio... $3,176,577
2 American Bridge, Chicago, Ill..... 3,335,307
3 Bethlehem Steel Co., Bethlehem, Pa..... 3,393,750

Bids: 12-7-54 Items	Unit	Quantity	Unit Prices 1 C	2
Carbon steel	lb	4,400,000	$0.286	0.2918
Silicon	lb	4,900,000	0.2875	0.3075
Conc for bridge deck:				
cl 1A	cy	730	130.00	139.00
lightweight	cy	730	144.00	152.00
Cement, portland, type 2	bbl	2,185	6.00	5.75
natural N	bbl	150	6.00	6.00
Air entraining agent	gal	20	2.00	2.10
Conc admixture	lb	2,500	0.30	0.40
Precast conc curb	lf	2,034	13.00	15.00
Bar reinf, structures	lb	355,000	0.17	0.1825
Spiral bar shear connct	lb	19,600	0.80	0.87
Asphalt plank paving	sy	4,000	8.00	9.00
Handrail	lf	2,165	19.00	19.10
Electrical work	ls	....	83,000	89,000
Inspectn & maint pltfrm	ls	....	36,000	39,000
Compl dt: Open brg to traf 11-1-55 Liq dam: $1,000 ea day remaing work 1-1-56 Liq dam: $100 ea day				

Access roads totalling 6 mi, 4 mi of single-track railroad for Barnhart extension line and Long Sault rail spur, and 4.4 mi of classification yard track are under construction northeast of Massena by Wm. A. Smith Contracting Co., Inc. of Missouri.

1C William A. Smith Contg. Co. Inc. of Missouri, Kansas City, Mo..... $922,368
2 W. E. O'Neill Const. Co., Syracuse, N. Y.... 1,039,616
9 Sheridan Const. Corp., Buffalo 21, N. Y..... 1,727,787

Bids: 10-25-54 Items	Unit	Quantity	Unit Prices 1 C	2
Hwy & RR except track:			$397,499	$561,026
Excavation, RR & hwy	cy	329,000	0.55	0.65
Overhaul	stay	20,000	0.02	0.005
Embankment, RR & hwy	cy	329,000	0.07	0.20
Hwy grd rail, 2 wire, f&e	lf	5,750	2.45	4.00
RCCP, f&i, 18"	lf	410	6.50	10.00
24"	lf	336	9.80	16.00
30"	lf	120	13.20	20.00
54"	lf	400	33.10	50.00
60"	lf	160	45.00	70.00
Riprap, dry, in place	cy	80	12.50	100.00
Grav fndn crse, ROB	cy	26,600	1.75	3.00
Bit mac top crse	cy	6,500	6.00	6.50
matl, penetr method	gal	35,000	0.18	0.20
Asphalt concrete, type 3A	t	7,000	7.50	10.00
Seeded topsoil	ac	7	630.00	1,000
Seeding	ac	7	220.00	450.00
Barnhart & L Sioux RR:			255,545	215,300
Track, furn & lay	lf	20,800	5.95	4.75
Cross ties, furn & pl	ea	11,500	5.07	5.30
Ballast, furn & pl	cy	11,000	6.68	5.05
Classif yard track:			269,324	263,290
Track, furn & lay	lf	23,600	5.44	5.40
Cross ties, furn & pl	ea	13,000	4.88	5.45
Ballast, furn & pl	cy	12,500	6.20	5.20
Compl dt: 6-15-55 Liq dam: $500 ea cal day				

Tecon-Grafe-Callahan contracted to deliver 2.225 million tons of aggregate for Barnhart power plant and Long Sault dam. Nine bids were received on the schedule awarded, for delivery by rail to the classification yard.

1C Tecon-Grafe-Callahan, Dallas, Texas.... $4,098,064[a]
2 Savin Const. Corp., Ea. Hartford, Conn... 4,558,400
12 Central Engrg. & Contractg Corp., Durham, N. C..... 6,013,700

Bids: 1-5-55 Items	Unit	Quantity	Unit Prices 1 C	2
Sand, natural	t	635,000		
mfgd, with discnt	t	635,000	$2.47	$2.99
mfgd, without	t		2.99	3.40
Cr rock, crse aggr w/dis	t	1,590,000	1.59	1.67
without	t		1.93	1.90

Delivery dates: between 5-55 and 6-1-58
a Informal bid Barrett Div., Allied Chem. & Dye Corp., $4,027,250 incl disc (sand $1.81, aggr $1.81/t)
b incl disc for award sand and crse aggr
c 1 bid rec, Racquette River Const. Corp., $2.50 w/disc

Northeastern Electric Construction Corp. submitted low bid on power facilities for Barnhart Island and Long Sault dam construction. They include 3 mi of 3-phase, single-circuit 115-kv transmission line and overhead ground wire; 3.7 mi of double-circuit 3-phase 13.8-kv line; a 115/13.8-kv substation with two 10,000-kva transformers; two 13.8-kv load centers; and a 13.8 kv tap.

1C Northeastn Elec. Constr. Corp., Syracuse, N. Y..... $149,904
2 Buffalo Electric Co., Inc., Buffalo, N. Y.... $179,695
9 David W. Murray Co., Cleveland, Ohio... 512,889

Bids: 1-5-55 Items	Unit	Quantity	Unit Prices 1 C	2
Substation, 20,000 kva:				
Clear land & ROW	ls	....	$5,050	$4,740
Const, install equip	ls	1	16,757	27,900
Load centers, 13.8 kv:				
Clear land & ROW	ls	....	5,225	2,060
Const, install equip	ea	2	8,040	3,800
Transm line, 115-kv:				
Clear land & ROW	ls	....	6,510	740.00
Const pole structures:				
45' max	ea	1	379.65	386.00
50'	ea	13	394.07	372.00
55'	ea	15	427.92	395.00
60'	ea	6	449.64	426.00
65'	ea	2	560.61	477.00
45' max	ea	1	454.80	630.00
50'	ea	3	479.90	543.00
55'	ea	1	533.17	598.00
60'	ea	3	616.33	615.00
Assemble & att X-braces	ea	36	51.64	33.00
Const guy w/o strain ins	ea	52	20.97	57.00
Place guy anchors	ea	52	20.07	52.00
Assemble & att susp-ins assembl, 8 ins	ea	129	34.73	70.00
10 ins	ea	42	42.21	83.00
String 3φ, 1-cir 3/0 AWG ACSR conductor	mi	3	1,165	2,100
String 3/8" 1-strand copperweld ov hd grd wr	mi	3	687.67	887.00
Drive grd rod, inst cable	ea	50	4.64	63.00
Transm line, 13.8-kv:				
Clear land & ROW	ls	....	7,366	1,120
Const pole structures				
30' poles	ea	15	139.44	302.00
35'	ea	10	164.47	316.00
40'	ea	3	181.23	454.00
45'	ea	3	199.91	467.00
50'	ea	1	213.40	400.00
det F, 30' poles	ea	1	139.44	332.00
35'	ea	1	164.47	348.00
G 30'	ea	1	269.37	355.00
40'	ea	2	311.23	370.00
45'	ea	1	326.59	403.00
H 30'	ea	3	283.89	328.00
35'	ea	6	308.92	343.00
40'	ea	1	325.75	390.00
J 80'	ea	2	874.51	950.00
K 45'	ea	2	783.09	1,238
L 45'	ea	1	1,313	470.00
Assemble & att X pieces	ea	54	45.47	51.00
Const single guy porc ins	ea	70	24.92	56.00
Place guy anchors	ea	70	22.57	94.00
Install guy protectors	ea	70	7.61	26.00
pin-type ins on X-arms	ea	195	6.93	16.00
Assemble & att 2-unit tens ins, 1-string	ea	202	18.99	36.00
2-string	ea	12	28.13	95.00
susp ins	ea	12	16.06	36.00
String 2-circ 3φ 336,400 CM ACSR	mi	2.8	6,819	8,140
556,500 2,200'	ls	....	4,659	4,770
Att vibr dampr, 556,500CM/	ea	24	13.50	30.00
Furn sp strain ins, b & s	ea	30	3.05	4.70
pin ins, 23 kv tie-top	ea	20	2.30	4.95
13.8-kv tap:				
Clear land & ROW	ls	....	2,900	440.00
Const pole struct:				
det E 35' poles	ea	1	164.47	348.00
45'	ea	1	199.91	379.00
G 30'	ea	1	169.37	355.00
Assemble & att X-braces	ea	4	45.47	51.00
Const single guy, porc ins	ea	8	24.92	63.00
Place guy anchors	ea	8	22.57	98.00
Install guy protectors	ea	8	7.61	29.00
pin-type ins on X-arms	ea	12	6.93	13.00
Assemble & att 2-unit tens ins	ea	24	18.99	38.00
String 2-circ 3φ, 4/0 cu cable bare str, 1,000'	ls	....	1,748	3,510

Sixteen 60,000 kva generators for the United States half of Barnhart Island power house are under contract to General Electric Co. for $13.2 million. Nearest competitor was Brown Boveri & Co. of Switzerland who bid on four generators. Two firms were awarded contracts for eight 71,000 hp turbines each: Allis-Chalmers Mfg. Co., for $5.051 million; Baldwin-Lima-Hamilton, $5.086 million.

THE TEETH in this drag line bucket now are fabricated from 3" sections of USS "T-1" Steel. Teeth are flame-cut, bolt holes are drilled, then teeth are water quenched and tempered to a surface hardness of 388 to 401 Brinell. No all-over machining is required, as it was previously. Flame cutting does not cause steel to crack. "T-1" cuts costs, saves time, improves performance.

How USS "T-1" Steel in Drag Line Bucket Teeth increased service life ten times

This hefty drag line is used to break and load ferromanganese which is made by the Blast Furnace Department of U.S. Steel's Duquesne Works. Ferromanganese is extremely hard and dense, so the bucket teeth must have exceptional resistance to impact abuse and abrasion.

When we bought this machine, the manufacturer used the best steel then available for the job. But still the teeth broke easily – and lasted for only 4 to 8 hours of operation. Replacement down time was frequent and expensive.

Just as an experiment, we tried our new "T-1" Steel in this rugged application. It worked beautifully. Instead of 8 hours, we are getting *80 hours* of service from each set of teeth – ten times more. Down time and replacement costs are about *a tenth* of what they used to be. Naturally we'll continue to use "T-1" Steel in this job, in the entire bucket as well as the teeth.

USS "T-1" Steel can cut costs for you in a wide variety of applications. Write for detailed facts and figures.

USE "T-1" AT HIGH TEMPERATURES. New USS "T-1" Steel has good creep rupture strength up to 900° F. It is being used in heavy-duty parts that operate at high temperatures.

USE "T-1" AT LOW TEMPERATURES. This same steel is amazingly tough at sub-zero temperatures. In pressure vessels, it has survived impacts of 2,000,000 ft. lbs. at 38 degrees below zero F. In addition, it has good resistance to impact abrasion.

USE "T-1" TO CUT FABRICATING COSTS. You have a yield strength of 90,000 psi. in "T-1" yet you can weld or flame cut this steel without pre- or post-heating. Your welds will develop the full 90,000 psi. And you can fabricate parts either in the shop or the field—wherever it is more convenient and less costly. With "T-1" Steel you can save money or improve design—sometimes both—in bridges, pressure vessels, heavy-duty trucks, excavating machines, mine cars, high speed rotating machines, steel mill equipment, and stamping and forging presses.

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TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
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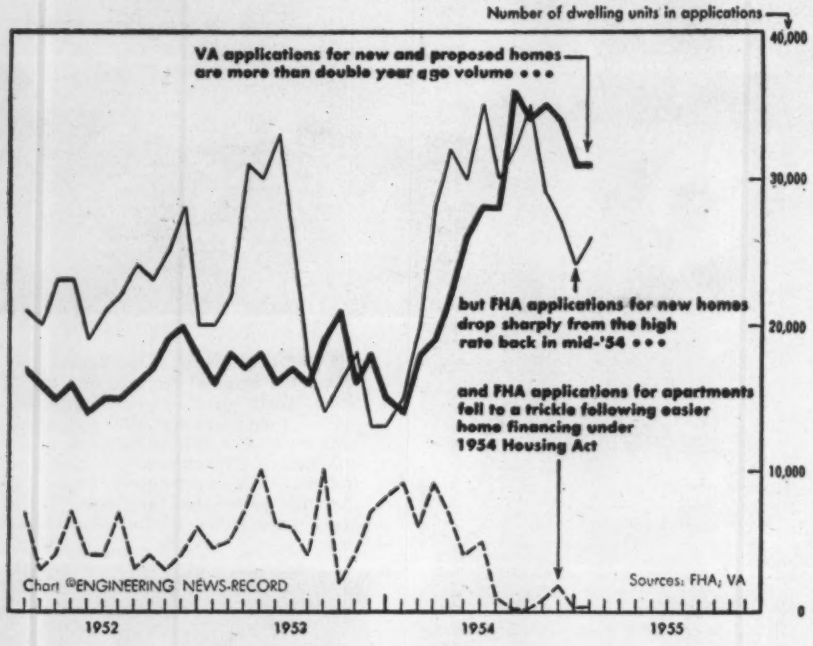
USS "T-1" CONSTRUCTIONAL ALLOY STEEL

USS

5-203

UNITED STATES STEEL


Number of dwelling units in applications
VA applications for new and proposed homes are more than double year ago volume
but FHA applications for new homes drop sharply from the high rate back in mid-'54
and FHA applications for apartments fell to a trickle following easier home financing under 1954 Housing Act
40,000
30,000
20,000
10,000
0
Chart ©ENGINEERING NEWS-RECORD
Sources: FHA; VA
1952
1953
1954
1955

Veterans Spark Housing Boom

January starts set new highs, despite low figure for public units—VA applications, up strongly, lead parade

The nation's housing industry was off and running toward another big year this week, as latest reports from the Bureau of Labor Statistics showed an all-time January high in housing-unit starts.

To be specific, the BLS reported a total of 88,000 starts for January 1955 —33% higher than the figure for the same month in 1954. Seasonally adjusted, said statisticians, that would be a rate of 1,424,000 new starts for 1955, compared to an actual total of 1,287,000 for 1954.

And that rate was achieved despite a drastic reduction in new starts for public housing. In January of this year, only 200 units were started, against 1,300 a year ago, and 1,400 in December of 1954.

• **Where's spark?**—It isn't hard to find the spark that has continued to drive the housing machine along at its present rapid pace. The spark lies in the credit terms available to veterans of both World War II and Korea, on the basis of reported applications for VA loans.

An analysis of VA figures shows that applications for loans in January 1955, for instance, were a whopping 122% higher than they were in January 1954. And in the six months ending this January, that means the applications were coming in at the rate of about 35,000 per month (see chart at left).

In the same period, applications for FHA loans for new homes were up 71% over January of 1954. That rate, however, was well below August 1954.

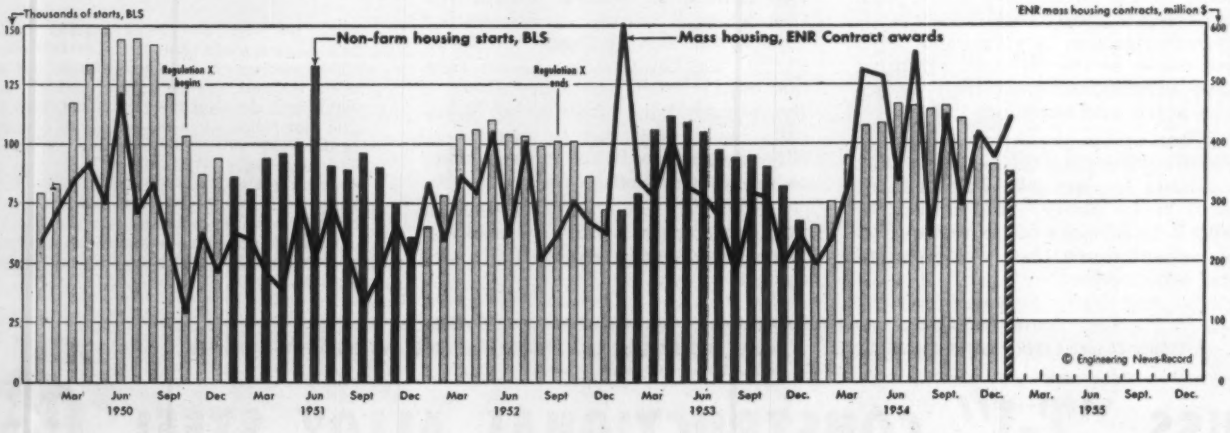
And it's to be noted that, for the six months ending this January, VA applications averaged 33,780 per month—only 6% below the pace set in the record year of 1950. (Of course, many of the applications may be turned down, or not used—but the rate has long been considered a basic indicator of the trend.)

• **Private work leads**—As expected, the record level of contracts for housing costing $300,000 or more reported by ENR early in 1954 accurately forecast the high number of starts in the second half of the year. All of the rise is due to private work, offsetting the public housing slump.

In dollar terms, the private housing figures look even better. In the first seven weeks of 1955, ENR reported contracts for a value of $761 million—up 121% over the same period in '54 and 19% over the record dollar volumes of private mass housing awards in the first seven weeks of 1953.

• **Caution**—Although starts for January were at new high levels, statisticians were inclined to inject a note of caution.

They point out that the January 1955 private starts were a little under those for December of 1954—counter to what has seemed a normal seasonal pattern. That might mean some leveling—at a very high level, nevertheless—of the housing boom, it was pointed out.



Bond sales are mounting . . . with rising school construction

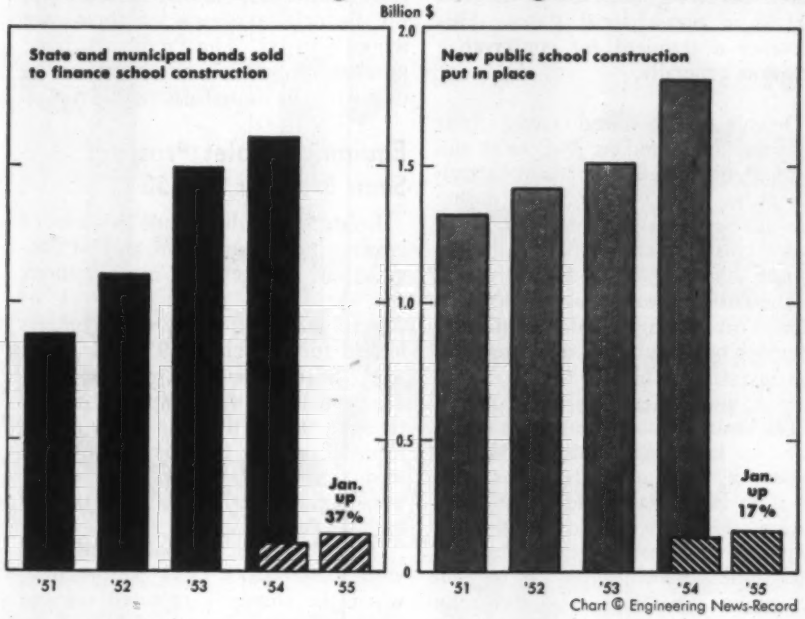


Chart © Engineering News-Record

THE LONGER LOOK:

President's proposal that U. S. purchase bonds accents financing problems of school districts

President Eisenhower undoubtedly caused many raised eyebrows when he proposed that the federal government cooperate with state governments in purchasing school bonds issued by local communities which are handicapped in selling bonds at a reasonable interest rate.

School bonds are selling in record volume. Over the past four years, in fact, school bond sales have been increasing at an even faster rate than the impressive rise in school construction. And these bonds, which are income tax exempt, commonly sell at interest rates slightly over 2½%, well under the 3¼% described as a limit for "reasonable" rates by the White House.

How does it happen, then, that some communities are handicapped in selling bonds at the prevailing low rates? Essentially, it is because there is doubt among bond buyers regarding the ability of these communities to sustain additional obligations. In order to compete with offerings from communities in more solid financial shape, their bonds must carry premium interest rates. And many of these communities are among those in most desperate need of new school buildings.

Assuming the plans for a school are soundly engineered and any necessary approval of the voters has been secured, there still may be serious barriers to sale of bonds at low interest rates.

• **Debt ratio**—Real property valuation, the basis for most local school taxes, generally stands behind bonds issued by local school units. Investment bankers, according to the municipals department of Goldman, Sachs & Company, are reluctant to bid on bonds if total indebtedness will exceed 15% of assessed valuation. (The rule-of-thumb used to be 10%, but inflation has made most property assessments unrealistically low.) Many states, indeed, impose debt limits far lower—8% in New York, 5% in Pennsylvania, 2% in Kentucky.

• **Population**—Any community with less than 5,000 population has difficulty attracting the attention of investment bankers. It probably has little industry, is unlikely to have total property valuation high enough to support debt of any size, and may be subject to shifts of population and industry which a larger and more balanced community could survive. To qualify as legal investments for savings banks in New York state, school

(*Continued on page 82*)

he's working for you

THIS FELLOW IS TRAINED IN YOUR BUSINESS. His main duty is to travel the country — and world — penetrating the plants, laboratories and management councils . . . reporting back to you every significant innovation in technology, selling tactics, management strategy. He functions as your all-seeing, all-hearing, all-reporting business communications system.

THE MAN WE MEAN IS A COMPOSITE of the editorial staff of this magazine. For, obviously, no one individual could ever accomplish such a vast business news job. It's the result of many qualified men of diversified and specialized talents.

AND, THERE'S ANOTHER SIDE TO THIS "COMPOSITE MAN," another complete news service which complements the editorial section of this magazine — the advertising pages. It's been said that in a business publication the editorial pages tell "how they do it" — "they" being all the industry's front line of innovators and improvers—and the advertising pages tell "with what." Each issue unfolds an industrial exposition before you — giving a ready panorama of up-to-date tools, materials, equipment.

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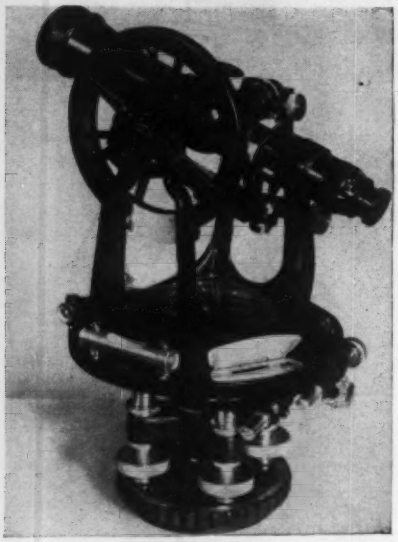

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bonds must be issued by districts having at least 10,000 population in states bordering on New York and 30,000 in non-adjacent states. This becomes a standard for conservative investors generally.

• **Default record**—Bond rating firms (Moody and Standard & Poor's) and investment houses may not attach much importance to defaults during the depression if the community has had a good record otherwise. But no issuing authority which had defaulted in the past 25 years is eligible for the New York Savings Bank "legal list." Memory of default also may prejudice the investing public.

• **Tax limit**—Some communities which have no legal debt limit, or are still within it, are limited as to tax rates by state law or even the state constitution. Legislative action or popular referendum is usually needed to raise such limits, which can apply to debt service in 10 states. If approval for an increase cannot be obtained, the ability of the community to serve debt charges may be in doubt.

Local authorities and the communities themselves are sometimes to blame for shaky financial credentials. This is the case particularly with failure to adjust property valuations and local tax schedules above standards set in depression years and over-generous exemptions of potentially taxable property. But there is also, in reality, wide variation among school districts in the value of taxable property per student, ranging from less than a hundred to several hundred thousand dollars.

Many states have taken bold action to aid communities hampered in school building programs by financing problems. In some instances, this has taken the form of authorizing higher tax levies or opening non-property sources of revenue to localities. In 16 states, direct grants-in-aid are made for school construction.

School building authorities have offered probably the most dramatic approach to the financing problem so far. Pennsylvania has been the pioneer state in recent years, but Georgia, Indiana and Maine also have authority plans, and other states are considering adoption of this device. Under the Pennsylvania plan, a school authority (usually conterminous with a school district or a group of districts) issues bonds, builds the school, then rents it to the district on a lease-purchase basis. At the end of the lease term, the building becomes the property of the school district.

The theory behind the authority plan is the pooling of financial resources to insure adequate educational opportunities for children regardless of the financial resources of their own school districts. The President's bond purchase proposal is another effort to deal with the same basic problem.

Equipment Sales Prospect Seen Brighter for '55

Bolstering earlier trade reports of growing optimism on the part of construction equipment manufacturers was the annual report last week of Caterpillar Tractor Co., whose officers looked for a brighter 1955.

H. S. Eberhard, Caterpillar president, predicted the company's domestic sales should rise as a result of the expected rise in the level of national business, and said he thought export sales would continue on the present high level.

The brighter outlook contrasted with Caterpillar's 1954 performance, when the company reported sales of $401 million, a drop of 7.55% from 1953. Despite the 1954 sales drop, however, Eberhard said profit was $25 million, second highest in the company's history.

Business Briefs . . .

• **Stock split**—Stockholders of Penn-Dixie Cement Corp. will vote April 19 on a proposed three-for-one stock split, to increase present outstanding shares of 700,000 (par value $7) to 3,000,000 shares with a $1 par value. Holders have just received a 75-cent dividend (payable March 15) to bring 1954 rates up to $2.75 a share.

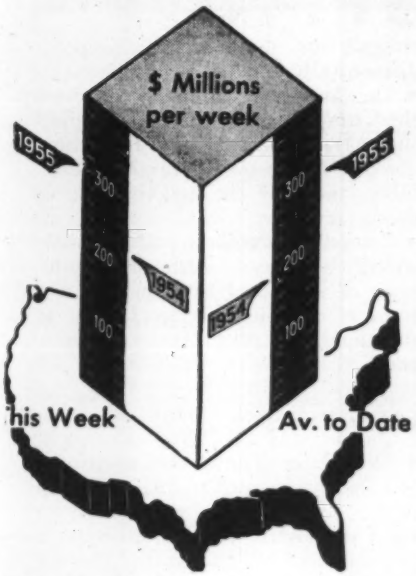
• **Cement expansion**—Marquette Cement Manufacturing Co. plans expansion of its plant in Superior, Ohio, from 1,000,000 to 1,250,000 barrels per year, at a cost of about $500,000; and will spend another half million for other plants, including a new office building at the Des Moines plant.

• **Earnings up**—Atlas Plywood Corp., for the second quarter of its fiscal year (ending Dec. 31, 1954) reported net income of $188,000—an increase of more than 95% over the first quarter of the year, and up slightly over second-quarter earnings in 1953.

• **Chemical plant**—E. I. Du Pont has picked a 500-acre site near Antioch, Calif., for a planned $10-million plant to manufacture tetraethyl lead and Freon. Construction—to be handled by Du Pont forces—will start this summer.

Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

	This Week	Cumulative 8 wks 1955	1954	% chge
Federal	$26.1	$267.3	$149.7	+79
State and municipal	78.3	633.5	573.4	+10
Total public	104.4	900.8	723.1	+25
Total private	207.8	1,479.4	809.8	+83
U. S. Total	$312.2	$2,380.2	$1,532.9	+55

Contracts by type of work

Waterworks	$6.7	$49.3	$28.0	+76
Sewerage	8.2	57.0	42.0	+36
Bridges	11.7	76.3	69.2	+10
Highways	27.5	239.3	172.2	+39
Earthwork, waterways	1.8	60.1	46.7	+29
Buildings:				
Public, excl. hsg.	26.3	235.3	215.6	+9
Housg., public	...	8.0	29.1	−73
Housg., private	116.1	877.1	406.0	+116
Commercial	35.6	183.7	159.9	+15
Industrial	40.7	350.0	212.6	+65
Unclassified	37.6	244.1	151.6	+61
Total	$312.2	$2,380.2	$1,532.9	+55

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

New capital for construction

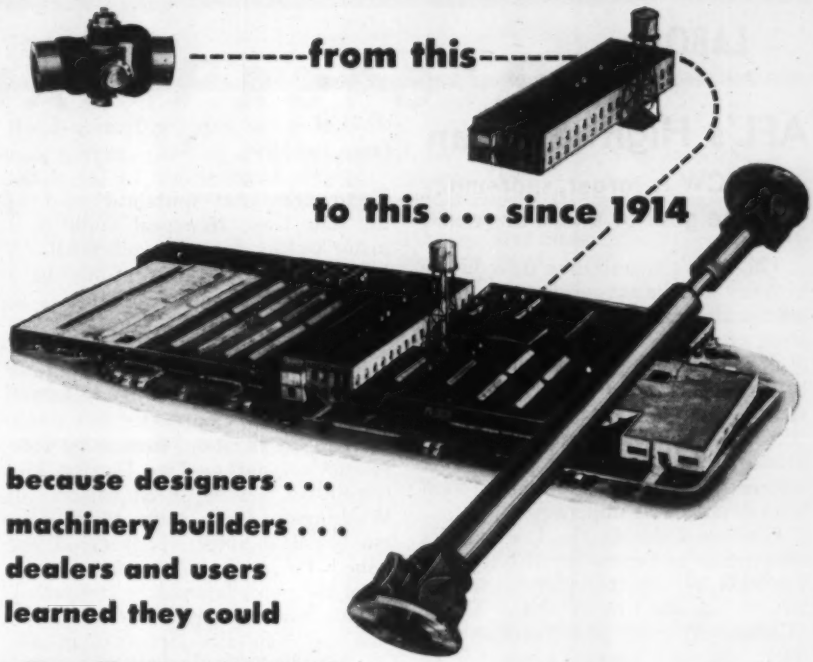
(millions of dollars)

	Week of Feb. 17 1955	Cumulative 7 wks 1955	% chge '54-'55
Corporate securities	$92.1	$395.3	−9
State and municipal:			
All except housing	97.7	498.2	+23
Housing	...	32.4	+142
Federal loans	6.9	15.0	−18
Federal aid	...	...	...
Total non-federal	$196.7	$940.8	+8
Federal appropriations:			
In U. S.	...	...	...
Outside U. S.	...	...	...
Total new capital	$196.7	$940.8	+8

ENR cost and volume indexes, 1955

		Base years = 100 1913	1926	1949
Construction cost	2/17	646.11	310.59	135.45
	2/3†	645.84	310.46	135.39
Building cost	2/17	459.70	248.50	130.67
	2/3†	459.43	248.35	130.60
Volume	Jan.	560	228	162
	Dec.	464	189	134

† Official monthly index for Feb. 1



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AFL's Highway Plan

UCW is target, supremacy the goal of union drive

The AFL's organization drive in the highway and heavy construction field, led by the carpenters, laborers, operating engineers and teamsters unions, is moving into high gear. Formation of area committees in the 14 zones, sprawling across 37 states and the District of Columbia, has been completed. Strategy planning and a program of information and education on the local level is now well underway.

Conceived during the Los Angeles convention in September (ENR Sept. 23, 1954, p. 21), the drive is directed largely against the United Mine Workers' District 50. But the plan itself seeks to correct a number of inter-union abuses and, through mutual cooperation and assistance, to improve the welfare of each of the four participating unions.

To protect their respective jurisdictions, the four unions have agreed to the no-raiding principle and through elimination of work stoppages are tendering to contractors a promise of savings in highway construction costs. Hoped-for result is a corner on the market when the stimulus of President Eisenhower's proposed multi-billion-dollar highway program is felt.

Directing the drive on the national level is a four-man joint committee representing each union. On the local level are 14 area committees of the same composition. Their functions: To carry out the national policy of inter-union unity, elimination of work stoppages resulting from jurisdictional disputes, and settlement of controversies on the local level; to see that the four trades are employed on projects "without discrimination," "to alert favorable employers to bid on jobs and pledge cooperation to the extent annunciated in the policy," and to assist local organizations in promotion of the program. Arming them with statistics is AFL's National Education and Information Bureau.

New Course, New Opponent In Union Security Debate

Before winding up its executive council meeting in Miami this month, the AFL changed its course—but not its tune—on the controversial right-to-work laws. Labeled the "big issue now before Congress," union security will get its big push in Washington instead of in the state legislatures (ENR Dec. 16, 1954, p. 84).

Specific target is Sec. 14 (b) of the Taft-Hartley Act—umbilical cord of the state laws. Its repeal would be a major victory for organized labor. A bill which would thus nullify in a single stroke all such legislation is already before Congress.

While the AFL was changing its course, a new opponent of compulsory unionism appeared – the National Right to Work Committee. It's a nonpartisan organization, headed by Taft-Hartley's co-author, Fred Hartley. The committee, with headquarters in Washington, D. C., hopes to prick the emotional bubbles which cloud the issue. Its credo: "Americans must have the right, but not be compelled, to join labor unions."

These new developments in the struggle for union security pinpoint diametrically opposed philosophies:

- The laws are "immoral" because they trespass upon man's God-given and natural instinct for association, abrogate his sense of social responsibility, and defy the majority rule of democracy.
- Compulsory unionism is "morally wrong" because it violates every principle of individual freedom and is a form of economic slavery foreign to the moral concepts of American democracy.

Plumbers Look Ahead

Sparked by a desire to keep abreast of progress in technology, a new training program for plumbers is being organized in Phoenix, Ariz. It is sponsored by 119 plumbing contractors and the ALF plumbers union. Present goal is to turn out 25 new journeymen a year and to train those who are already journeymen in new techniques and developments.

Under the program, member contractors pay five cents an hour per employe into a training fund. Training in theory is given apprentices at the Phoenix Technical School and one apprentice each year will be sent to Phoenix College to study engineering. A plan to provide scholarships for five additional apprentices a year will soon be established.

Labor Briefs . . .

- **TVA Rates**—The U. S. Department of Labor has refused to take action on AGC's objections to wage rates set for TVA (ENR Jan. 13, p. 84). It says its hands are tied—in the absence of a "dispute," it has no legal authority to intercede.

- **Detroit unions**—Detroit's Building and Construction Trades Council, representing 70,000 AFL members, has served notice it will not forego a pay raise this year. The stand was taken after some of the Chicago building trades unions had indicated a willingness to hold the line on rates.

- **Sheet metal workers**—A new contract for sheet metal workers in western Washington grants a wage increase of 2½ cents and provides for an equal increase on July 1. This brings the present rate to $2.96, plus 14 cents in welfare benefits and vacation pay.

- **Davis-Bacon**—A snag developed in Air Force construction work at Myrtle Beach Air Base, S. C., when Sen. Johnston requested bidding be held up pending a restudy of wage rates. In setting the minimum rate, the U. S. Department of Labor based its determination on Wilmington, N. C., rates. Johnston claims it should have used the Charleston, S. C., scale which is higher.

- **Purge**—The AFL has continued its crackdown on Communists in Canadian unions (ENR Jan. 6, p. 71) with suspension of 18 rank-and-file members from Local 213 of the electrical workers union in Vancouver. The group was charged with leftist activities, following top-secret investigations by IBEW officials from Washington, D. C. The action is part of AFL's attempt to maintain and extend its strength in Alcan and other northern projects.

OFFICIAL PROPOSALS

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Contract No. P-5

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PENNSYLVANIA RAILROAD'S 25TH STREET OVERPASS AND ROADWAY GRADING PASSYUNK AVENUE TO 24TH STREET, PHILADELPHIA, PENNSYLVANIA of the Bridge over the Delaware River connecting Packer Avenue, Philadelphia, Pennsylvania, and Gloucester, New Jersey

Sealed bids will be received for Pennsylvania Railroad's 25th Street Overpass and Roadway Grading Passyunk Avenue to 24th Street, Philadelphia, Pennsylvania over the Delaware River Port Authority, Adminis- Philadelphia, Pennsylvania and Gloucester, New Jersey, known as Contract P-5, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P. M., (Eastern Standard Time), March 10, 1955, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon a deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $35,000.00 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 per cent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4355), will be received at Rupert, Idaho, until April 5, 1955, for furnishing labor and materials for construction of Unit "A" Pumping Plant, North Side Pumping Division, Minidoka Project, Idaho. Location near Burley, Idaho, in Jerome County. Principal items are 12,000 cu. yds. excavation; 1,500 cu. yds. concrete; 175,000 lbs. furnishing and placing reinforcement bars; 90,000 lbs. furnishing and erecting structural steel; 7,200 sq. ft. furnishing and erecting steel siding and decking; 164,000 lbs. installing five motor-driven pumping units; 24,000 lbs. installing motor-operated gate valves; 1,300 ft. 78-inch diameter discharge lien, may be monolithic, or precast concrete, or steel; and other work. Completion time 520 days. For particulars, address Bureau of Reclamation, Rupert, Idaho; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

Bids: March 8, 1955

Power Authority of the State of New York
Advertisement for Proposals

FOR
THE CONSTRUCTION OF
THE GRASS RIVER BRIDGE AND APPROACHES TO STATE HIGHWAY #37 AND TO NORTH GRASS RIVER ROAD
NEAR MASSENA, ST. LAWRENCE COUNTY, NEW YORK
SPECIFICATIONS NO. 5431
ST. LAWRENCE CONTRACT NO. 10

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the construction of the Grass River Bridge and Approaches to State Highway #37 and to North Grass River Road near Massena, St. Lawrence County, New York, until 10:30 A. M. Eastern Standard Time on the 8th day of March, 1955 at the Authority's office, 270 Broadway, in Room 1207A, New York 7, New York, at which time and place proposals will be publicly opened and read aloud.

The principal items of work as estimated are:

75,000 cu. yds. Earth Excavation
114,000 cu. yds. Embankment in Place
1,800 tons Asphalt Concrete
2,700 cu. yds. Calcium Chloride Treated Gravel Outside Shoulders
22,000 sq. ft. Cofferdam
5,890 cu. yds. Concrete
790 tons Structural Steel
330,000 lbs. Bar Reinforcement for Structures
4,100 lin. ft. Steel Bearing Piles

The bridge structure shall be opened to the uninterrupted flow of traffic on or before December 15, 1955.

The contract work shall be completed on or before February 15, 1956.

Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineers, Praeger-Kavanagh, 126 East 38th Street, New York 16, New York; The Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Plans, Specifications and Proposal Forms may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1207A, New York 7, New York, upon application and pre-payment of a fee of Forty ($40.00) Dollars per initial set and Twenty ($20.00) per set for additional sets, no part of which will be refunded.

Bids must be made upon the Proposal Forms included in the Contract Documents. Each proposal must be accompanied by draft or certified check payable to the order of the Power Authority of the State of New York for the sum of Fifty Thousand Dollars ($50,000).

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

Bids: March 15, 1955

Construction of Water Treatment Plant

Sealed bids for the construction of Water Treatment Plant for the Williamson Water District will be received by the Town Board of the Town of Williamson at the Town Office in the Fire Hall, Williamson, New York until 4 p.m. o'clock E.S.T. on the 15 day of March, 1955.

Bidding forms can be obtained and plans and specifications examined at the office of the Town Clerk at Williamson, New York or the office of William S. Lozier Company, Engineers, 10 Gibbs Street, Rochester, New York.

Copies of plans and specifications may be obtained upon the payment of twenty dollars ($20.00) for each set, which will not be refunded.

The work consists of the construction of addition to the Water Treatment Plant and Pumping Station at Pultneyville, New York capacity of additional two million gallons per day.

LESLIE LAWRENCE
TOWN CLERK

February 24, 1955

Bids: April 15, 1955

Power Authority of the State of New York
Advertisement for Proposals

FOR
CONSTRUCTION OF
BARNHART ISLAND POWER PLANT
NEAR MASSENA, ST. LAWRENCE COUNTY, NEW YORK
SPECIFICATION NO. PA-5-11001
ST. LAWRENCE CONTRACT NO. 9

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the construction of Barnhart Island Power Plant and appurtenant works near Massena, St. Lawrence County, New York until 10:30 A.M. Eastern Standard Time on the 15th day of April, 1955 at the Authority's office, 270 Broadway, Room 1207A, New York 7, New York, at which time and place proposals will be publicly opened and read aloud.

The principal items of work are: Estimated:

1,602,500 cu. yds. Embankment and riprap for forebay dike and access roads
260,200 cu. yds. Miscellaneous fills
1,630,200 cu. yds. Earth excavation
415,000 cu. yds. Borrow excavation
195,000 cu. yds. Rock excavation for power plant
142,400 lin. ft. Drill holes for exploration and grouting
890,100 cu. yds. Concrete
18,730 tons Reinforcing steel
2,808 tons Structural and miscellaneous steel
9,174 tons Erection of gates, trashracks, stop logs and cranes
11,000 tons Erection of hydraulic turbines
16,000 tons Handling of generator parts and electrical equipment.

The work shall be completed on or before December 30, 1959.

Plans, specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Plans, specifications and Proposal Forms may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1207A, New York 7, New York, upon application and prepayment of a fee of Fifty ($50.00) dollars, per initial set and Twenty-five ($25.00) dollars per set for additional sets, no part of which will be refunded.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Gurantee will be required with each bid in an amount not less than 10 percent of the gross sum bid except that guarantee in excess of $2,000,000 will not be required.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

February 11, 1955

OFFICIAL PROPOSALS

Bids: March 8, 1955

Pennsylvania Turnpike Commission
Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 a.m., Eastern Standard Time, the 8th day of March 1955, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following contract:

For the construction of structures and the grading, drainage paving of the Turnpike Section 37-H, part of the Northeastern Extension of the Pennsylvania Turnpike in Jenkins and Pittston Townships, Luzerne County, Commonwealth of Pennsylvania, this section being situated as follows:

Beginning at a point approximately 48 lineal feet northeast of the center line intersection of an earth road leading to a reservoir at Turnpike station 742+50 in Jenkins Township, Luzerne County; thence in a northeasterly direction 11,150 lineal feet to Turnpike station 854+00 at a point approximately 641.5 lineal feet northeast of the center line intersection of the Erie Railroad in Pittston Township, Luzerne County, a distance of approximately 2.11 miles.

The approximate quantities of the principal items are as follows:

Class I-A Excavation	154,700 cu. yds.
Class I Excavation	822,999 cu. yds.
Class 2 Excavation	8,348 cu. yds.
Class 2A Excavation	665 cu. yds.
Special Subgrade	89,586 sq. yds.
Reinforced Concrete Pavement	58,235 sq. yds.
Class A Concrete	1,171 cu. yds.
Class B Concrete	2,015 cu. yds.
Plain Steel Bars	322,350 lbs.
Fabricated Structural Steel	242,000 lbs.
Median Divider	10,266 lin. ft.
Cast-in-Place Concrete Piling	6,017 lin. ft.

Copies of plans, specifications and other contract documents including cross-sections, are on file and open to public inspection at the office of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania, on 23 February 1955. Plans, specifications, cross-sections and other contract documents will be available by this date for inspection or for mailing to prospective bidders. Copies of Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five (5) dollars per copy. Copies of cross-sections may be purchased from the Pennsylvania Turnpike Commission for the sum of fifty (50) dollars per set.

Plans and contract documents, for this section exclusive of cross-sections and specifications, may be purchased from the Pennsylvania Turnpike Commission for the sum of twenty (20) dollars for each set. No refund will be made for plans returned unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable by check or P.O. money order to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications, contract documents, and cross-sections.

The character and amount of bid security to be furnished by the bidder is stated in the Instructions to Bidders.

The Commission reserves the right to waive any informalities in or to reject any or all bids.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer
Harrisburg, Pennsylvania
14 February 1955

Bids: March 11, 1955

Waterworks Improvements

ADVERTISEMENT FOR BIDS

Sealed proposals for furnishing materials and labor for constructing waterworks improvements for the City of Chillicothe, Ohio, will be received by the Service Director at the Council Room in the City Hall, Chillicothe, Ohio, until twelve o'clock (12:00 noon, Eastern Standard Time), March 11, 1955.

The work consists of furnishing and installing Water Distribution System Improvements and Expansion including water main extensions, reinforcing mains, fire hydrants, valves, valve boxes, booster pump station improvements, elevated tank foundation and altitude valve vault; Elevated Tank and Appurtenances; Improvements in Water Treatment Plant including treating tanks, sludge room, chemical feeder lines and carbonation system. The work has been divided into three contracts as follows:

CONTRACT 2—WATER DISTRIBUTION SYSTEM IMPROVEMENTS AND EXPANSION
CONTRACT 3—ELEVATED TANK AND APPURTENANCES
CONTRACT 4—WATER TREATMENT PLANT IMPROVEMENTS

Each proposal shall be addressed to the Service Director of the City of Chillicothe, Ohio and endorsed "Proposal" with the Contract number and its title. Each proposal shall be accompanied by a certified check on a solvent bank drawn payable to the Treasurer of the City of Chillicothe, Ohio or in lieu of a certified check bidders may furnish a bid bond satisfactory to the City, in an amount equal to ten percent (10%) of the bid price, said check to be forfeited to the City of Chillicothe as liquidated damages in case of failure on the part of the successful bidder to execute the contract and furnish satisfactory surety bond within ten (10) days after acceptance of the proposal.

The check will be returned to the successful bidder if the contract is executed and the necessary bond furnished within the specified time limit, and the checks of the unsuccessful bidders will be returned to them after the award is made.

Blank proposal forms, detailed plans and specification may be obtained from Alfred LeFeber & Associates, 2933 Woodburn Avenue, Cincinnati 6, Ohio upon making a deposit in the amounts indicated in the following:

CONTRACT 2—$25.00
CONTRACT 3—$ 5.00
CONTRACT 4—$15.00

For Contract No. 2 and Contract No. 4 the full amount of the deposit—for one set of documents and one-half the deposit for any additional sets of documents will be refunded to each bidder who submits a formal proposal to the City of Chillicothe, Ohio, and who also returns the plans and specifications and additional sets in good condition to the Engineer within ten (10) days after his bid security has been returned to him.

Equipment manufacturers, sub-contracts and others who do not submit formal proposals to the City of Chillicothe, Ohio, will be refunded one-half (½) the amount of the deposit for all sets of complete documents including plans and specifications returned in good condition within ten (10) days after the opening of bids. No refund will be made for documents received after this ten (10) day period.

No refund will be made for the return of documents for Contract 3.

This project, being for a governmental unit, is exempt from Ohio Sales Tax under State Laws. Therefore, the project is exempted from Sales Tax on all materials, equipment and supplies actually incorporated into the work.

The Service Director reserves the right to reject any and all bids and to hold all bids for forty (40) days before final acceptance thereof.

City of Chillicothe, Ohio
By: Hugh N. Thompson
Service Director

Bids: March 22, 1955

Power Authority of the State of New York

ST. LAWRENCE POWER PROJECT
ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF 86,000 KVA SINGLE PHASE POWER TRANSFORMERS
SPECIFICATIONS NO. PA-4-14002
ST. LAWRENCE CONTRACT NO. P7

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the design, manufacture and furnishing of 86,000 kva, single phase power transformers and delivery thereof f.o.b. Massena, New York, until 10:30 a.m. Eastern Standard Time, March 22, 1955, at the Authority's office, 270 Broadway, Room 1207A New York 7, New York, at which time and place proposals will be publicly opened and read aloud.

Bids will be entertained for 13, 7, 6 or 1 power transformers and associated equipment and services in accordance with the bidding schedules. Erection at the site of installation will be done by others but services of erection engineers shall be provided by manufacturers if and when required.

Bids will not be restricted to American manufacturers.

Plans, specifications and proposal forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Plans, specifications, and proposal forms may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1207A, New York 7, New York, upon application and prepayment of a fee of Ten ($10.00) dollars per initial set of contract documents and Five ($5.00) dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid.

Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents. Guarantee will be required with each bid in an amount not less than 10 percent of the maximum price bid for any schedule.

The right is reserved to reject any or all bids.

W. S. CHAPIN
PA-4-14002 GENERAL MANAGER

U. S. Government

Department of Commerce, Bureau of Public Roads, February 10, 1955. SEALED BIDS will be received at the office of the Division Engineer, Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, until 11:00 a.m., E.S.T., MARCH 10, 1955, for Project 1A1-1B10-1D8, Colonial Parkway, York and James City Counties, Virginia: Grading and draining of bypass around Yorktown and from Williamsburg to College Creek. Length: 4.157 miles. The approximate quantities of the more important items are: 270,300 cu. yd. Excavation; 72,000 cu. yd. Borrow; 3,600,000 sta. yd. Overhaul; 850 cu. yd. Concrete and 41,400 lin. ft. Untreated Timber Piling. Minimum wage rates have been fixed as required by law. Plans, specifications, and proposal forms are available upon request at the address given above or Bureau of Public Roads, 920 South Jefferson Street, Roanoke, Virginia. H. J. Spelman, Division Engineer.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4354), will be received at Red Bluff, California, until March 31, 1955, for furnishing labor and materials for earthwork and structures, Corning Canal, station 361+75 to station 624+00, Sacramento Canals Unit, Central Valley Project, California. Location near Red Bluff, California, Tehama county. Principal items are 400,000 cu. yds. excavation; 39,000 cu. yds. compacting embankments; 155,000 cu. yds. placing earth lining; 2,140 cu. yds. concrete in structures; and other work. Completion time 550 days. For particulars, address Bureau of Reclamation, Sacramento, California; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

CONTRACTORS
WATCH
THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

U. S. Government

Bureau of Reclamation, North Platte River Projects 2955-P7, Casper, Wyoming. UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION. NOTICE IS HEREBY GIVEN that sealed bids on Specifications No. 703C-364 for furnishing labor and materials and performing all work for ASPHALT UNDERSEALING OF CONCRETE STRUCTURES CASPER CANAL AND LATERAL 256, Kendrick Project, Wyoming, will be mailed to Box 280, Casper, Wyoming, or delivered to the office of the Bureau of Reclamation in time for the public opening at 10:30 a.m., Mountain Standard Time, March 3, 1955, at the office of the Bureau of Reclamation, Reclamation Center, Casper, Wyoming.

Copies of the standard forms and of the specifications may be obtained from the following offices of the Bureau of Reclamation: R. J. Walter, Jr., Regional Director, Building No. 46, Denver Federal Center, Denver, Colorado; and I. J. Matthews, Projects Manager, Box 280, Casper, Wyoming. No charge for copies of the specifications and drawings furnished for bidding purposes; for all others $0.50 per copy, not returnable. Payments should be made by check or money order payable to the Treasurer of the United States.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4353) will be received at Superior, Nebraska, until March 16, 1955, for furnishing labor and materials for earthwork and structures, Courtland Canal-Station 1740+30 to Station 1836+19; Station 1839+45 to Station 1844+00; lateral 34.4 and drains. Location near Webber, Kansas in Jewell County. Principal items are excavation 346,000 cu. yds; compacting embankments 127,100 cu. yds; concrete in structures, 800 cu. yds; concrete pressure pipe 2,100 lin. ft; and other work. Completion time 400 days. For particulars, address Bureau of Reclamation, Superior, Nebraska; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

CORPS OF ENGINEERS, U. S. ARMY, PITTSBURGH DISTRICT—Sealed Proposals will be received at this office until 11:00 o'clock a.m., on the 17th day of March 1955, and then publicly opened, for Grading and Drainage Structures, Relocation of State Highway 7, New Cumberland Locks and Dam, Ohio River. Work to include construction of Water Intake and Discharge Structures through relocated Highway. Deposit on Plans $15.00. Further information on application at 1027 New Federal Building, Pittsburgh, Pa.

Department of Commerce, Bureau of Public Roads, February 16, 1955. SEALED BIDS will be received at the office of the Park Superintendent, Homestead, Florida, until 11:00 a.m., E.S.T., MARCH 16, 1955, for Project 1A1, Everglades National Park, Monroe County, Florida. Approximately 750,000 cu. yd. Dredging and Stockpiling Oolite Borrow near Flamingo. Minimum wage rates have been fixed as required by law. Plans, specifications, and proposal forms are available upon request at the offices of the Bureau of Public Roads, 1440 Columbia Pike, Arlington, Virginia, and Gatlinburg, Tennessee. H. J. Spelman, Division Engineer.

OFFICIAL PROPOSALS

Bids: March 22, 1955

Contract TA-230.002

THE PORT OF NEW YORK AUTHORITY
TETERBORO AIRPORT
REHABILITATION OF ELECTRICAL DISTRIBUTION SYSTEM

Sealed proposals for the rehabilitation of the electrical distribution system at Teterboro Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuseday, March 22, 1955, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1112. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of the documents, not exceeding three, returned within forty days after the opening of proposals

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, February 24, 1955

OFFICIAL PROPOSALS

Bids: March 4, 1955

Construction of River Piers

NOTICE TO CONTRACTORS
OF STATE HIGHWAY CONSTRUCTION
BIDS TO BE RECEIVED
March 4, 1955

Sealed bids will be received by the State of Tennessee Department of Highways and Public Works at their offices in the Cotton States Building, Nashville, Tennessee, until 10:00 O'Clock A.M. March 4, 1955

HAMILTON COUNTY:

Project No. U-072-1-(3)—The construction of four (4) river piers for a proposed bridge across the Tennessee River in Chattanooga, approximately 2000' west of the existing Market Street Bridge on Urban Route No. 72.

Working Days—400
(Unloading Point—Chattanooga)
No Proposals will be issued after 4:30 P. M., Thursday, March 3, 1955
THE ATTENTION OF THE BIDDER IS DIRECTED TO CHAPTER 135, ACTS OF 1945

Contractor must prequalify with the Department of Highways and Public Works in accordance with Chapter 80 of the Public Acts of 1929, before any Proposals will be furnished. PROSPECTIVE BIDDERS MUST HAVE FILED THEIR QUESTIONNAIRES FOR QUALIFICATION FIVE (5) DAYS BEFORE THE DATE OF LETTING. The right to reject any and all bids is reserved.

W. M. Leech
Commissioner

Bids: March 8, 1955

Power Authority of the State of New York

ADVERTISEMENT FOR PROPOSALS
FOR
CONSTRUCTION OF
PERMANENT SECTION OF ROBINSON TUNNEL ROAD NEAR MASSENA, ST. LAWRENCE COUNTY, NEW YORK
SPECIFICATION NO. PA-5-11006
ST. LAWRENCE CONTRACT NO. 12

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the construction of the Permanent Section of Robinson Tunnel Road and appurtenant works near Massena, St. Lawrence County, New York until 2:30 P.M. Eastern Standard Time on the 8th day of March, 1955 at the Authority's office, 270 Broadway, Room 1207-A, New York 7, New York, at which time and place proposals will be publicly opened and read aloud.

The principal items of work are:

Estimated:	
131,700 cu. yd.	Excavation, Road and Highway
74,800 cu. yd.	Embankment, Road and Highway
3,600 lin. ft.	Highway Guard Rail
730 lin. ft.	Reinforced Concrete Culvert Pipe (various sizes)
110 cu. yd.	Dry Rip Rap
17,700 cu. yd.	Bank Run Gravel
2,400 cu. yd.	Filled Stone Base Course
3,500 tons	Bituminous Macadam
3,335 tons	Asphalt Concrete (two types)
800 cu.yd.	Stabilized Shoulders

The work shall be completed on or before July 15, 1955.

Plans, specifications and proposal forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Plans, specifications and proposal forms may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1207A, New York 7, New York, upon application and prepayment of a fee of Twenty-five ($25.00) dollars per initial set and Ten ($10.00) dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid.

Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents. Each proposal must be accompanied by draft or certified check payable to the order of Power Authority of the State of New York for the sum of $30,000.00.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

OFFICIAL PROPOSALS

Bids: March 2, 1955

Pennsylvania Turnpike Commission
Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 a.m. Eastern Standard Time, the 2nd day of March 1955, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room No. 1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and immediately publicly opened and read aloud, for the following contract.

For the construction of substructure, Turnpike Section 37AB, Hawk Falls Bridge, part of the Northeastern Extension of the Pennsylvania Turnpike in Carbon County, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point on the left descending bank of Mud Run, Carbon County at Turnpike Station 944 on the Turnpike centerline, thence in a northerly direction across Mud Run to Turnpike Station 953 on the Turnpike centerline, a distance of 0.170 mile.

The approximate quantities of the principal items are as follows:

Class 2 Excavation.....	1,539 cubic yards
Class A Concrete.....	2,373 cubic yards
Reinforcing Bars	106,790 pounds
Fabricated Structural Steel	34,970 puonds

For the construction of substructure, Turnpike Section 37DE, Lehigh River Bridge, part of the Northeastern Extension of the Pennsylvania Turnpike in Carbon and Luzerne Counties, Commonwealth of Pennsylvania. This section being situated as follows:

Beginning at a point on the left descending bank of the Lehigh River at Turnpike Station 1445 in Carbon County on the Turnpike centerline, thence in a northwesterly direction across the Lehigh River to Turnpike Station 13 in Luzerne County on the Turnpike centerline, a distance of 0.113 mile.

The approximate quantities of the principal items are as follows:

Class 2 Excavation.....	1,923 cubic yards
Class 2x Excavation (River Piers)	571 cubic yards
Class A Concrete.....	3,967 cubic yards
Reinforcing Bars	205,970 pounds
Fabricated Structural Steel (Anchor Bolts)..	1,232 pounds

Copies of plans, specifications, and other contract documents are on file and open to public inspection on 18 February 1955, at the office of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania. Plans, specifications, and other contract documents will not be available before this date for inspection or for mailing to prospective bidders. Copies of Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five (5) dollars per copy.

Plans, and contract documents, for this section, exclusive of specifications, may be obtained from the Commission upon deposit of twenty (20) dollars for each set. No refund will be made for plans returned unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable by check or P.O. money order to the Pennsylvania Turnpike Commission and must accompany requests for specifications, drawings and contract documents.

The character and amount of bid security to be furnished by the bidder is stated in the Instructions to Bidders.

The Commission reserves the right to waive any informalities in or to reject any or all bids.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE
James F. Torrance
Secretary and Treasurer
Harrisburg, Pennsylvania
9 February 1955

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:
(Not available for equipment advertising)
$1.80 cents a line, minimum 3 lines. To figure advance payment count 5 average words as a line.

POSITION WANTED undisplayed advertising rate is one-half of above rate, payable in advance.

PROPOSALS, $1.80 a line an insertion.

INFORMATION:

BOX NUMBERS count as 1 line additional in undisplayed ads.

DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

DISPLAYED—RATE PER INCH:

The advertising rate is $20.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. E.N.R.

Send NEW ADVERTISEMENTS. To New York Office, 330 W. 42nd St., N. Y. for March 10th issue closing February 28th.

THE AUSTIN COMPANY

Offers Opportunities to Qualified Engineers and Draftsmen

Positions are open to capable engineers and draftsmen who can design and/or prepare plans and specifications for complete industrial plants, all related structures, and building equipment falling within the following categories:

DESIGNERS—Office buildings, laboratories, and industrial buildings. Positions require those possessing vision and creativeness.

STRUCTURAL—Industrial buildings and miscellaneous structures of steel and reinforced concrete.

MECHANICAL—Heating, air conditioning, ventilation systems, process piping, conveying systems, plumbing, sewer, and sprinkler systems.

ELECTRICAL — Industrial lighting and power distribution and controls.

DETAILERS—Structural steel fabrication for industrial buildings.

Assignments are in connection with our long-established offices located on the East coast and Midwest areas. Desirable working conditions, established vacation and sick leave plans, also paid holidays.

Full particulars as to education, experience, and compensation desired should be given in first letter.

NATIONAL HEADQUARTERS
16112 Euclid Ave. Cleveland 12, Ohio

CONSTRUCTION MANAGER

Construction administrator experienced in heavy construction. Capable of assuming direction of an established construction company. Must be capable of administering estimating construction scheduling and equipment operations.

Minimum of 15 years' exp required.

P-5593, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

MECHANICAL ENGINEER WANTED

Graduate Mechanical Engineer experienced in pulp and paper maintenance for large progressive mill in Middle Atlantic States. Under 35 years of age. Good salary with excellent opportunity for advancement. Give detailed resume of experience.

P-5431, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

ENGINEERS

Foreign Service

Graduate Chemical, Mechanical, and Electrical Engineers with minimum of 5 years' experience. For specialized assignments commensurate with qualifications in various phases of project and process engineering. Write giving full particulars regarding personal history and work experience. Please include telephone number.

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SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED RECENT Civil or mechanical engineering graduates, general field municipal water supply. Annual increase in salary and bonus. Profit sharing plan. Frequent changes in location. Pitometer Associates, Engineers, 50 Church Street, New York City.

BRIDGE DESIGNERS. Experienced and inexperienced men with a civil engineering degree wanted for a period of about 24 months in the office of a well known organization in Central Pennsylvania. State qualifications, age, salary requirements and availability in first letter. P-5355, Engineering News-Record.

ASSISTANT ENGINEER wanted by the City of Watertown, New York. Salary $4050 to $4530. Retirement, sick leave, vacation and longevity benefits. Experience in municipal engineering preferable. Write or call City Engineer, City Hall, Watertown, New York.

WANTED: BRIDGE & Highways designers with office and field experience by consulting engineering firm in Pennsylvania. Give complete details and salary desired. P-5389, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT — For general contractor—experienced on multi-storied, steel-framed office buildings—location, Manhattan—write for interview, giving age, experience, etc. P-5514, Engineering News-Record.

CIVIL ENGINEER: Registered Professional Engineer or engineer-in-training. Municipal engineering work in city engineer's office. Experience in highways or structures desirable. Apply 500 Municipal Building, Dayton 2, Ohio.

DRAFTSMAN — EXPERIENCED structural steel detailer and checker for building construction. Permanent. All employee benefits, paid vacation, insurance, etc. Submit resume and salary desired. Barber & Ross Company 5th & V Sts., N. E. Washington, D. C.

EXPERIENCED STRUCTURAL steel draftsmen wanted by established Southern fabricator. Permanent jobs. Pay rate open, depending on experience, ability. Write detailed application giving full information, salary expected. P-5620, Engineering News-Record.

Design engineer senior cost engineer senior office engineer senior

Employment offered in Afghanistan. Work to be on large land development program. Two year contract single status basis.

Write:

Morrison-Knudsen Afghanistan, Inc.
74 New Montgomery St.
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Wanted At Once

Foreman to lay large Lock-Joint Concrete Pipe in open trench.

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OWNER
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POSITIONS VACANT

WANTED—YOUNG technically trained man, preferably mining engineer, interested in the field of commercial explosives, their development and sales. Position permanent with excellent opportunity for advancement into executive fields. Location in eastern state. Interview arranged on basis of letter stating qualifications and salary desired. Recent photograph helpful. P-5612, Engineering News-Record.

BRIDGE DESIGNER, Richmond, Virginia, graduate civil engineer, several years experience railway bridge designing. Give age, education, experience, reference, salary. P-5613, Engineering News-Record.

ENGINEER TO plan and direct Engineering Department in expanding suburban community. Four years' experience. Merit System Examination. Starting salary $6500, plus expenses. For details and application, write First Selectman, Trumbull, Connecticut before March 4th.

WANTED: ARCHITECTURAL draftsman for school and church drafting, building and structural design. Need experienced man qualified to take responsibility. Write P. O. Box 204, Lancaster, Ohio giving qualification, experience and salary or phone Lancaster 2243W for appointment.

CHIEF, WATER Pumping Stations salary: $6192 to $7777 a year. Excellent opportunity with Philadelphia's Water Department. Vocational or high school graduation plus eight years experience in maintenance and operation of large electrical pumping stations. Four years of experience should have been in supervision. Substitutions of experience or training for above will be considered. Civil service security, health and welfare plans, paid vacations, holidays and sick leave. For further information, contact Personnel Application Office, Room 127, City Hall, Philadelphia 7, Pennsylvania before March 28, 1955.

CHIEF CEMENT Chemist wanted with experience as Chief or Assistant Chief Chemist in a Portland Cement Manufacturing Plant or equivalent. Attractive proposition awaits the right party. Location, middle eastern states. P-5582, Engineering News-Record.

(Continued on opposite page)

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Thoroughly experienced in all phases of highway design. To organize and take charge of new department with 35 yr. old consulting engineering firm in Chicago. Send complete resume with current references and state salary requirements.

P-5646, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

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Mechanical Draftsmen for general plant engineering work in large pulp and paper mill. Chemical plant experience in process and piping drafting desirable. Positions permanent. All employee benefits, insurance, vacations, retirement, etc. Send Resume to

Director of Personnel
WEST VIRGINIA PULP & PAPER CO.
LUKE, MARYLAND

POSITIONS VACANT

(Continued from opposite page)

SMOKE & HEATING Plant Inspector Wanted, $410 a month to start. Annual automatic increases to $475. Later longevity increases. Inspectional and enforcement work on all types of heating plants and ventilating systems; and smoke abatement. Applications accepted until needs of service filled. Residents of Illinois, Iowa, Minn., Mich., and Wis. only. Personnel Division, City Hall, Madison 3, Wis., ALpine 6-8331.

POSITIONS WANTED

CONSTRUCTION EXECUTIVE, available as project manager, on large operation, chief estimator for large organization or in other executive position where scope warrants employment of top man, thoroughly experienced on all types of construction and in every phase of general contracting. PW-5074, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT or Project Manager 35 years in heavy construction, most recent on oil refinery and chemical plants. Also on major steel mill expansion in Chicago area. Past experience includes several major office buildings in Chicago as well as two oil refinery units in Europe. Can supply highest references from former employers. Available after Feb. 1st, 1955 am willing to go anywhere, but would prefer the far west or deep south. Reply to PW-5327, Engineering News-Record.

COST AND Office Engineer (27) six years industrial construction wants chance to help contractor save time and money. PW-5238, Engineering News-Record.

CONSTRUCTION STIFF, Rigger, who has worked with lubricating oil for years as a hobby, seeks employment in a modest capacity, with a construction company, or other fleet owner using large quantities of oil, where his information and paraphernalia will be investigated, and where he will be encouraged to go ahead with some things he wants to do. Local or foreign. Sidney Stribling, Sta. 8, Asan, Agana, Guam, M. I.

CONSTRUCTION SUPT. or general foreman 35 years experience in construction of buildings, commercial, industrial and public. From foundation to finish. N Y C or vicinity. PW-5528, Engineering News-Record.

B.S.C.E. 28. Five years experience in steel bridge and building erection with large fabricator. Field, office, and engineering. Desires to relocate with fabricator-erector or consultant. PW-5529, Engineering News-Record.

B.S.C.E., 32, 6 years experience in all phases of highway engineering. Expert in design and construction of any size highway project. PW-5535, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT, over 20 years broad experience various types projects. Engineer. Anywhere. PW-5538, Engineering News-Record.

Development Engineer

For laboratory studies relating to concrete products manufacture and concrete building construction. Must be graduate engineer, preferably in structural engineering, and have a genuine interest in research and development work in the building field. Should be able to conduct laboratory studies entailing physical testing of building components and measurement of strain and deformation under load conditions. Excellent opportunity to acquire a varied background in the development of new and improved uses for concrete and concrete products. State age and salary expected and full details of educational background and work experience. Opening located in suburban area of Chicago.

P-5609, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

SALES OPPORTUNITY:
COMMERCIAL INSTITUTIONAL ALUMINUM WINDOW MFR. WANTS NEW YORK MANAGER TO PROMOTE IN SPECIFICATION STAGE WITH ARCHITECTS. EXPERIENCE IN SPECIALTY SELLING TO ARCHITECTS REQUIRED.

SW-5467, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS WANTED

CONSTRUCTION EXECUTIVE with 23 years experience in both field supervision and administration of all types of construction in North America and overseas, including complete new deevlopments consisting of buildings of all kinds, bridges, airfields, roads, railroads, services, utilities, etc., requires supervisory or administrative position. Willing to travel overseas. PW-5534, Engineering News-Record.

CHIEF ESTIMATOR general superintendent. Thoroughly experienced all phases of construction industry. Available March 1st. PW-5554, Engineering News-Record.

ENGR-SURVEYOR, party chief, etc. exper. field & office. College instructor 5 yrs. PW-5643, Engineering News-Record.

CONSTRUCTION ENGINEER executive, general, project manager, superintendent coordinator C.E. & M.E. 30 years experience all phases of construction; air fields, federal, state, city, industrial, roads, bridges, sewerage disposal, power plants, estimating, designing; negotiate contract etc. Languages—French, Spanish, Italian. Relocate U.S.—abroad. PW-5634, Engineering News-Record.

CITY, COUNTY engineering position desired. Reg. prof. engr., age 28. BSCE, 5 years experience in all phases highway engineering. 2 years at supervisory level. M.S. in sanitary engr. Available in May. PW-5628, Engineering News-Record.

(Continued on following page)

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P-5641, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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Must have 10 years' experience in various phases of construction and engineering operations, and be able to supervise and direct the work of others. Graduate Engineer required.

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Technical and Narrative Reports
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Write, giving detailed account of experience, education, etc.

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MECHANICAL ENGINEER WANTED

Graduate Mechanical Engineer experienced in the operation of Fourdrinier paper machines, refining and related equipment for large progressive mill in Middle Atlantic States. Under 35 years of age. Good salary and excellent opportunity for advancement. Give detailed resume of experience.
P-5434, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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330 W. 42 St., New York 36, N. Y.

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Construction Superintendent
for work in Kansas, with experience in institutional and office buildings, industrial type buildings and government projects. Must be capable of taking complete charge of work. State starting salary, age and when available.
P-5521, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS WANTED
(Continued from preceding page)

CONSTRUCTION SUPERINTENDENT and engineer desires work in New England. Experienced industrial plants, housing, heavy construction, bridge and marine work, skilled estimator. PW-5638, Engineering News-Record.

COST CUTTING Purchasing agent 20 years construction experience including expediting, sub-contract negotiation, cost accounting. Major projects. Available now. PW-5615, Engineering News-Record.

CIVIL AND Industrial engineer, 33, single, BCE., C.E., MSIE., AM ASCE, 11 years as civil and administrative engineer in office and field, USA and overseas, interested in responsible position in promotion, sales or management. Relocate or overseas. Perfect English, French, German, Italian, some Spanish and Portuguese. PW-5640, Engineering News-Record.

GRADUATE SANITARY Engineer. 10 yrs. engineering-sales-administrative experience in Industrial & Municipal water & waste treatment. PW-5642, Engineering News-Record.

ENGINEER-ESTIMATOR 29, BSCE 5 years field engineer heavy construction, 1 year office engineer and estimator. Desires office position. Will relocate. PW-5604, Engineering News-Record.

CONSTRUCTION ENGINEER, BSCE, 30, five years steel mill and industrial construction experience. Competent in field supervision, layout and quantity takeoff. Will assume duties as field superintendent, area engineer, or field engineer for progressive contractor. Available two weeks. PW-5605, Engineering News-Record.

ESTIMATOR—PRICING, take-offs, all types heavy construction. Eleven years experience including positions as cost engineer, project manager, design engineer. Prefer position where administrative experience will be used. P.E., N.Y.C., L.I. PW-5579, Engineering News-Record.

WORK WANTED

STRUCTURAL STEEL detailing work wanted by experienced men. Bridge detailing a specialty. Located near metropolitan N. Y. area. WW-5484, Engineering News-Record.

WORK WANTED—Team of reliable Reg. Prof. Engr., designers & draftsmen would like to do struct. consulting work for archts. & engrs. in the Phila. area. WW-5602, Engineering News-Record.

SPECIAL SERVICES

Appeals Service: Construction Contractors, who intend to appeal decisions of the contracting officer concerning disputed questions of fact under government contracts, are offered complete representative service covering analysis, preparation and processing of appeals. SS-5062, Engineering News-Record.

Alfa Engineering Service highly qualified engineers will do street planning for housing developments, estimate of quantities, real estate takings, R.O.W. maps, grading and drainage design, general computations, highway design, etc. for engineers, contractors and architects. SS-5631, Engineering News-Record.

BUSINESS OPPORTUNITY

Surveying business and equipment of the late Herbert H. Brehmer for sale. Twenty years reputation of accurate work. Address: Mrs. Agda Brehmer, Suttons Bay, Leelanau County, Mich.

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BO-5619, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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FS-5507, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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W-5610, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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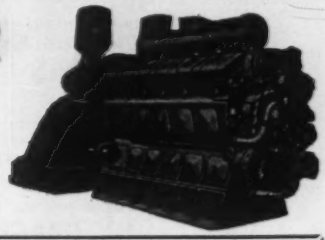

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750	General Motors	12-567	1080	720	200	General Motors	8-268A	350	900
700	Worthington	EE-8	1000	327	175	General Motors	12-71	275	1800
675	Fairbanks Morse	38D	960	720	150	Buckeye	80	240	600
500	General Motors	8-567	720	720	148	Fairbanks Morse	32E14	220	300
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EDITORIALS

Toll Collectors Needed?

AN HONOR SYSTEM in toll paying is on trial at three of six toll ramps now operating on New Jersey's Garden State Parkway. No toll booth operators are on duty between midnight and 8 a.m. on the rural ramps. The results? They boost your faith in human nature. Some people using the ramps have even sent in dollar bills in advance, while drivers without change have deposited dollar bills with notes attached for forwarding the correct change due them.

Perhaps the New Jersey parkway authority has found the answer to the problem of toll collection during the light traffic hours of the night. But beyond this contribution the New Jersey experiment may have a wider significance in broadening thinking with respect to toll collections generally. For it must be noted that most attempts to develop efficient toll collection facilities have been concerned almost solely with keeping drivers and toll collectors honest. Should they be more honest than has been supposed, more thinking can be focused on designing quicker, easier toll depositing devices and less on such crime-detecting apparatus as counters, weighers, flashing lights and the like.

This reorientation of thinking about the purpose of toll-collecting equipment would hardly be carried to the point of leaving a bucket at the side of the road for toll deposits, as someone has suggested. But it might well lead to the development and use of more automatic toll collection devices if the New Jersey experiments indicate that elaborate policing attachments are not as necessary as most people had thought.

A Sanitation Pioneer

THIS NATION owes a debt of gratitude to M. N. Baker, who died Feb. 7 at the opening of his 91st year, for what he did to improve the public water supplies on which each of us now depends so confidently. Without in any way detracting from the records of the great sanitary engineers of his day, we believe it can be said that no one contributed more than he to the advancement of environmental sanitation and the orderly solution of water-supply problems in the latter part of the 19th Century and the first quarter of the 20th. He did this through the written word backed by inspired personal research for the facts.

When M. N. Baker began his work on the editorial staff of ENGINEERING NEWS, epidemics of typhoid fever were common in this country. Also, little was known statistically about the operations involved in supplying water to our cities. Mr. Baker's first major contribution to correction of the latter situation was publication in 1888 of his "Manual of American Water Works," which he kept up to date for ten years before turning the work over to the American Water Works Assn.

The elimination of typhoid fever, however, was his real concern. Convinced that typhoid epidemics were the result of contamination of water supplies by sewage, Mr. Baker devoted an infinite amount of time to ferreting out information about the spread of that disease. These studies stimulated his interest in sewage disposal as well as water supply and led ultimately to his becoming the author of "Municipal Engineering and Sanitation," "Sewage Purification in America," "Potable Water" and, following a trip to Europe, "British Sewage Disposal." During the same period he wrote many articles and editorials for ENGINEERING NEWS and ENGINEERING NEWS-RECORD.

Following his retirement from the editorial staff of this journal, Mr. Baker summed up his many years of research for information relating to water supply in a book, "The Quest for Pure Water," which was published by the American Water Works Assn. in 1948.

Looking back over the nearly half century during which Mr. Baker served on the staff of this journal, it would appear that his great service stemmed from his indefatigable search for facts concerning the various phases of sanitary engineering and his skill in selecting the significant ones that should be recorded. As one of the pioneers who contributed to progress in sanitary engineering, he was also instrumental in setting high standards of service for engineering journals.

Highway Overloading

WHEN THE SUPREME COURT ruled that a state cannot bar from its highways truck operators who are habitual violators of weight and size restrictions, it added to the problem of preventing pavement destruction through overloading, but did not completely close the door to disciplinary action. States still can fine the violators, and if we read the Supreme Court's decision correctly, the fines can be of such magnitude as to make overloading unprofitable without fear of being declared unreasonable in a decision by that same court.

The Supreme Court's action puts responsibility for the success or failure of the efforts of state highway departments to end overloading back on local magistrates and courts. In the past they frequently have nullified police work by imposing fines that were insignificant in comparison to the profits that overloading brought to the offending truck operators. Possibly the state legislatures could help to correct that situation by writing a requirement for much higher fines for habitual offenders into law.

In any event, the important fact to be recognized is that the Supreme Court's action does not give unscrupulous truckers the right to continue to defy the state highway departments. It just puts responsibility for ending their abuses back on local agencies.

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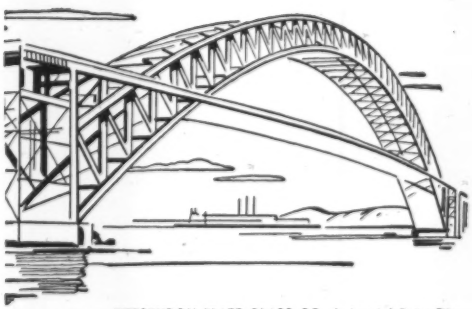

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Whips world's toughest terrain, TIMKEN® bearings take 23-ton load

ROLLING on Timken® bearings, this amazing LeTourneau Sno-Buggy, designed and built by R. G. LeTourneau, Inc., Longview, Texas, "floats" over snowfields, swamps and desert sands on the world's largest tires . . . 10′ high and 4′ wide, carrying as little as 5 lbs. pressure. Its individually-powered electric wheels propel it forward or backward at 8 m.p.h. over terrain never traveled before.

Rugged service like this means that its bearings have to take tremendous radial and thrust loads. That's one reason LeTourneau engineers specified Timken tapered roller bearings. Because of their tapered construction, Timken bearings take radial and thrust loads in any combination. They can take sudden shock loads, too, because their rollers and races are case-carburized to give them a hard, wear-resistant surface over a tough, shock-resistant core.

Line contact between rollers and races permits Timken bearings to carry the Sno-Buggy's heavy wheel loads. And the Sno-Buggy's huge dual tire wheels turn easily because Timken bearings are geometrically designed to have true rolling motion and precision manufactured to live up to their design. We even make our own steel to be sure of getting the best. We're the only U. S. bearing manufacturer that does.

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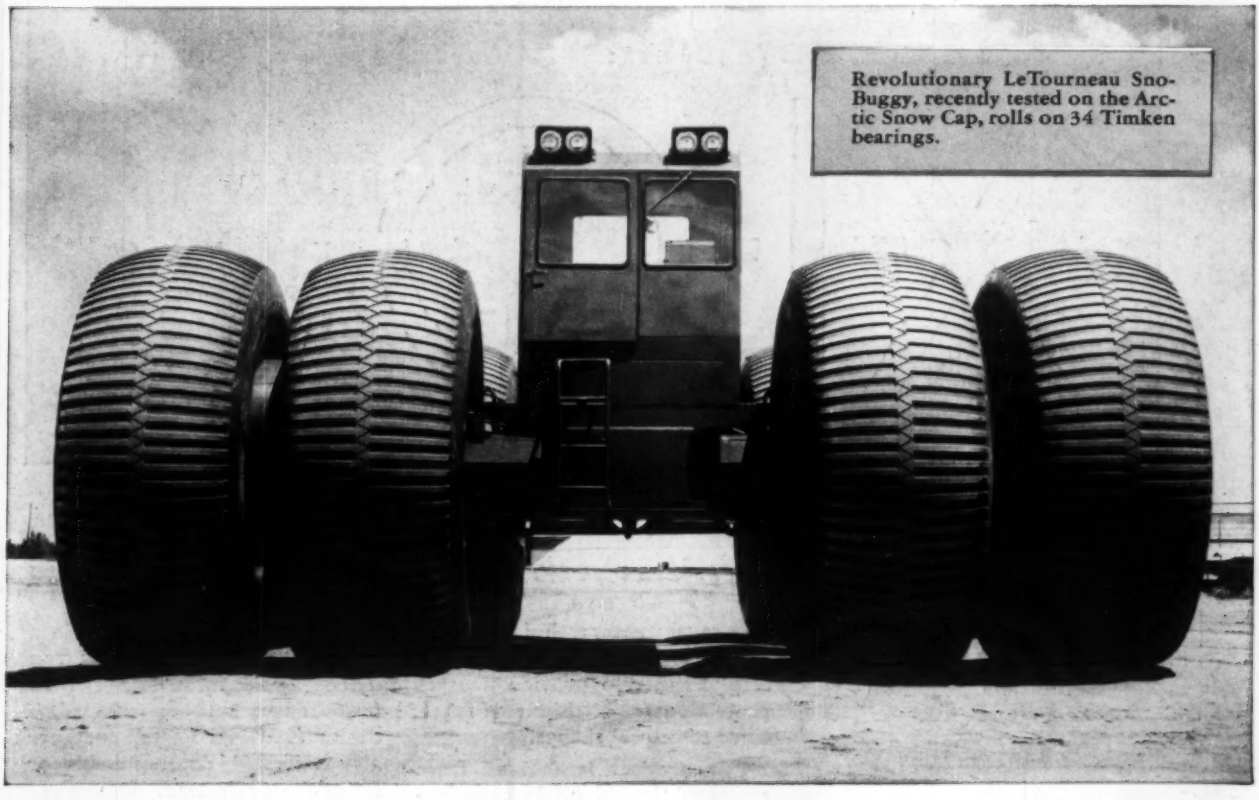
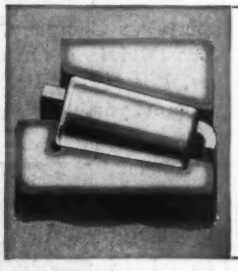


Revolutionary LeTourneau Sno-Buggy, recently tested on the Arctic Snow Cap, rolls on 34 Timken bearings.



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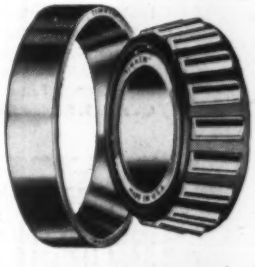

NOT JUST A BALL ◯ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⇕ AND THRUST →◎← LOADS OR ANY COMBINATION →✳←